AVIATION

The Oldest American Aeronautical Magazine

JULY 13, 1925 Issued Weekly PRICE 10 CENTS

Postmaster General New starting the New York-Chicago Night Air Mail

VOLUME XIX

NUMBER 2

SPECIAL FEATURES

SPAR DESIGN

THE WOODSON FOTO

NEW YORK-CHICAGO NIGHT AIR MAIL

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1915-1925

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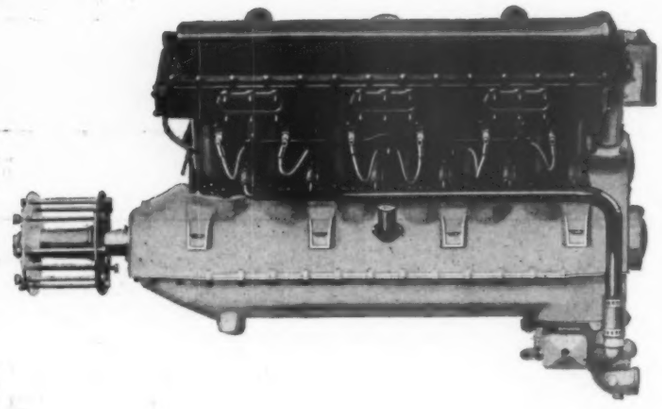

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JULY 13, 1925

AVIATION

VOL. XIX. NO. 2

Published every Monday

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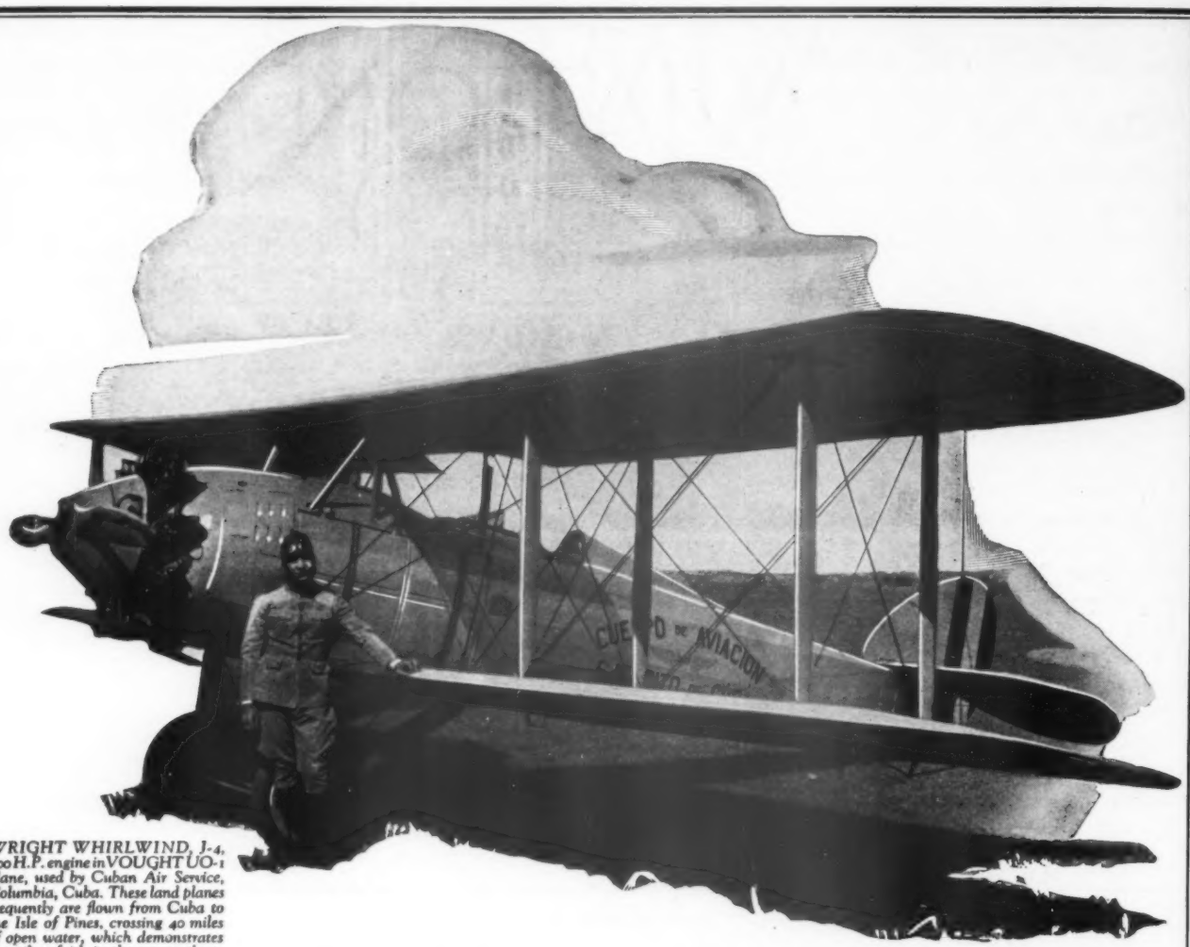

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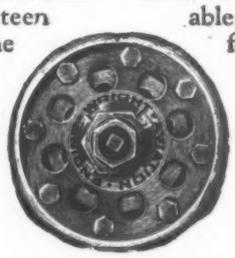

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VOL. XIX JULY 13, 1925 No. 2

A Significant Change

WHEN the announcement was made of the requirement of a $5,000 bond to be deposited with the Air Service before a civilian pilot could land on Air Service fields, AVIATION protested that this rule would act as a hindrance to the development of commercial flying.

It is a pleasure to note that this objectionable paragraph has been rescinded. On June 26, the War Department announced that it would be no longer required that "All persons before obtaining permission to use airdrome facilities as contemplated in Paragraphs 1, 2 and 3 above must furnish a bond for $5,000 to protect the Government against damage to property." This revocation is a recognition of the fact that Air Service fields may be regarded in the same way as are military roads. They are built and maintained by the government primarily for military purposes in time of war but in time of peace should be at the service of the public.

Another Epoch Starts

WHATEVER may be the future of commercial aviation the date July 1, 1925, when the New York-Chicago night Air Mail started will mark the beginning of the first real test in this country of the utility of commercial air transport. Hitherto, the routes have been between cities where the volume of traffic that would patronize air mail has not been sufficient to make them self supporting or the schedules have given little advantage over the railroad. Now, for the first time, two great cities have been so linked together by air that the service will afford a great saving of time over railroad transportation.

While we have never considered that the success of the Air Mail was dependent solely on its earning capacity, it will be of the greatest interest to watch the gains that are made in this direction. It was disconcerting to read that Colonel Henderson hinted, in Chicago, on the night of the opening of the new service, that there might be a withdrawal of certain portions of the western Air Mail service because of lack of support. Even though the patronage has been disappointing, the availability of this fast service between coasts in emergencies has been worth all that it has cost the government. More than that, any thought of its discontinuance should be met with every dissuading argument that can be made.

The Air Mail traffic problem is one that is not easy of solution. Creating a demand for anything requires two very different stimulants, publicity and advertising. Publicity only brings results from those who want to buy. Advertising creates markets, and sells to those who would not buy without a direct appeal to their individual advantage. The Air Mail encounters difficulties when traffic stimulation is needed. It can and has received great publicity, but its advertising is limited to cards in post offices and on mail trucks. There is no appropriation available for advertising. It is here that the weakness of any government ownership and operation is found. If the Air Mail were privately owned all the ingenuity of advertising skill would be utilized to attract traffic. Perhaps after all, the Air Mail will in the future be regarded as demonstrating only the feasibility of air transport. Private management may make it financially profitable.

Our congratulations are extended to those who planned the new night flying route, to those who have laid out the routes, to the pilots and, of course, to the rock on which the whole service rests, the ground personnel.

Getting Under Way

ALMOST every week for the past few years there have been announcements of commercial airlines which were about to start operations. Many observers had become so cynical that even the imposing list of directors of the National Air Transport Corp. left them without any conviction that a real commercial airline was to be started. The actual placing of an order for ten airplanes and thirty-five engines is a momentous event. It is the first quantity order for air transport machines to be placed in this country. To many the buying of only ten machines will seem a very small beginning but it must be realized that a modern plane is capable of doing an immense amount of flying if used intensively and properly handled. Some of the English planes have flown over 2,000 hr. so that if one trip a day each way were made between New York and Chicago for 300 days during the year less than three planes would be actually worn out during the course of the year.

The N.A.T. was fortunate in that the Air Mail competition had brought out a large number of planes suited for the work in hand and ultimately the N.A.T. will profit by all the ideas incorporated in the new ships which are being tried out by the Air Mail. It is to be hoped that the directors of the N.A.T. will also have sufficient vision and courage to branch out somewhat from the very conservative line of development followed by the Air Mail. It is claimed for example that a modern engine with its lighter weight and greater reliability will in the long run be more economical than a Liberty engine whose original cost is much lower. There is also the question of multi-engined machines which are becoming so prominent on the European air lines.

All these things are interesting propositions for the future, if the N.A.T. is financially successful in its venture. In the meantime the company has actually placed a substantial order and should receive the congratulations of the rest of the aeronautical community.

Direct Solution of Airplane Spar Design *

By IVAN H. DRIGGS

Until this time, to the writer's knowledge, there has been no attempt made to develop any procedure whereby an airplane wing spar may be designed directly, without recourse to trial and error.

The so called precise method recently adopted by the Air Service and the Navy Department, although somewhat more laborious as used at present, may be so simplified by a few very reasonable assumptions as to make it possible to solve directly for the location of the struts in a biplane truss. After the beam running load and compression load has been determined in the usual manner a very simple calculation gives the necessary moment of inertia. With the center height given from the ordinates of the airfoil used, and the moment of inertia calculated, the remaining dimensions of the beam follow easily.

Such a simplified calculation has many advantages: The time saving permits a much fuller investigation of weights with different trusses and airfoils on perliminary design than can be done under the older method, and consequently leads to more efficient structures; final design calculation is practically eliminated; a better understanding of the phenomena of flexure as it relates to the design of airplane wing beams is given to the average non-technical reader.

The following asumptions are made in order that a solution may be reached as outlined above:

1. The moment of inertia and the depth of the wing beam are both constant throughout its length.

2. The numerical values of the maximum bending moments on the beam are all equal.

3. The end load produced by the wing truss equals the Euler crippling load for the beam, between points of support, as a pin ended column.

Consider first the upper front (or rear) spar of a single bay biplane fixed or continuous at its inner ends. (Fig. 1.)

From assumption 2. $M_1 = -M_{max} = M_2$

By symmetry $M_{max} = M_{center}$

And $X = L/2$

Then $D_1 = M_1 - wj^2 = D_2$ from 1.

Where w = Running beam load in lb./in.

and $j = \sqrt{\dfrac{EI}{P}}$

P = End load

I = Moment of Inertia of Spar.

and E = Modulus of Elasticity of the material used.

Then from the formulae of the Precise Method

$$M_{max} = \left(\frac{D_1}{\cos x/j} + wj^2\right) = -M_1 = -M_2 \qquad 2$$

$$\text{Therefore } \frac{M - wj^2}{\cos L/2j} + wj^2 = -M$$

$$M - wj^2 + \cos L/2j\ wj^2 + M \cos L/2j = 0$$

$$M\ (1 + \cos L/2j) = wj^2\ (1 - \cos L/2j)$$

$$M = wj^2 \frac{(1 - \cos L/2j)}{(1 + \cos L/2j)}$$

Since from asumption 3.

$$L/j = \pi$$

$$\text{Then } M = wj^2 \frac{(1 - 0)}{(1 + 0)}$$

Therefore $M = wj^2$ 3

But since $M_1 = .3333\ w\ L_c^2$ when the ordinates of the tip loading curve are assumed to vary as a semi-ellipse

$$wj^2 = .3333 wL_c^2$$

and $L^2/\pi^2 = .3333 L_c^2$

Let $y = L_c/L$

$$\text{Then } y = \frac{1}{.57735\,\pi} = .55132 \qquad 4$$

That is $L_c = .5513L$

This formula fixes the location of the outer strut for any truss designed under the above assumptions and enables the designer to proceed at once with the determination of the truss loads and spar sizes.

Referring to assumption 3 above,

$$L/j = \pi$$

$$\text{therefore } L = \pi\sqrt{\frac{EI}{P}}$$

$$\text{Then } I = \frac{L^2P}{\pi^2E}$$

$$I = .1013\frac{L^2P}{E} \qquad 5$$

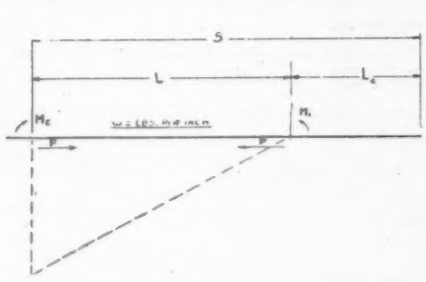


FIG. 1

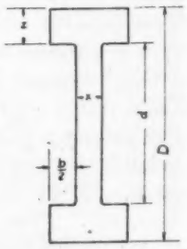


FIG. 2

This equation gives the necessary moment of inertia to keep the maximum bending moments all equal with the location of outer strut point given by formula (4). After the end load (P) has been found by the usual method it is a very simple matter to determine the spar dimensions as shown by the following example.

Example

Refer to Fig. 1 $S = 200$ in.

$w = 10$ lb./in.

$P = 8000$ lb.

$D = 4.5$ in. = Depth of spar.

Then from (4) $L_c = 68.0625$ in.

$L = 131.9375$ in.

$$\text{Then from (5) } I = \frac{.1013 \times 131.9375^3 \times 8000}{1{,}600{,}000}$$

$= 8.8184$ in.^{4}

But $M = .3333\ w\ L_c^2$

Then $M = .3333 \times 10 \times 68.9625^2$

$= 15429$ lb.—in.

To establish a low limit of spar width first assume that the beam is a solid unrouted plank.

Spar Unrouted

$$\text{Spar width} = B = \frac{12I}{D^3} = \frac{12 \times 8.8184}{4.5^3} = 1.1613 \text{ in.}$$

Spar area $= A = 5.2256$ in.^{2}

$$\text{Sect. Mod.} = Z = \frac{8.8184}{2.25} = 3.9193 \text{ in.}^3$$

$$P/A = f_c = \frac{8000}{5.2256} = 1531 \text{ lb./in.}^2$$

$$M/Z = f_b = \frac{15429}{3.9193} = 3940 \text{ lb./in.}^2$$

$f_t = 5471$ lb./in.^{2}

Modulus of Rupture of solid spar $= 10{,}300$ lb./in.^{2}

$$\text{All. } f_t = \frac{3940}{5471}(4800) + 5500 = 8957 \text{ lb./in.}^2$$

$$f_t/\text{all. } f_t = \frac{5478}{8957} = .6108$$

$$\text{Weight of spar} = \frac{200 \times 5.2256 \times 30}{1728} = 18.2 \text{ lb.}$$

Width of Spar $= B = 1.5$ in.

$$\text{Moment of Inertia of solid} = \frac{1.5 \times 4.5^3}{12} = 11.391 \text{ in.}^4$$

To be removed by routing $11.391 - 8.818 = 2.573$ in.^{4}

Let $d = 3\,b$ (since $D = 3B$)

Then $27/12\ b^4 = 2.573$ in.^{4}

$b = 1.0335$ in.

$d = 3.1005$ in.

$x = .4665$ in.

$z = .69975$ in.

And $Z = 3.9193$ in.^{3}

$A = 3.546$ in.^{2}

$f_b = 3940$ lb./in.^{2}

$f_c = 2256$ lb./in.^{2}

Modulus of Rupture $= 7050$ lb./in.^{2}

$f_t = 6196$ lb./in.^{2}

$$\text{All. } f_t = \frac{3940}{6196}(7050 - 5500) + 5500$$

$= 6490$ lb./in.^{2}

$f_t/\text{all. } f_t = .954$

If there are six places where the spar is left unrouted for fitting attachment for an average length of 5 in. the spar weight becomes:

$$\text{Wt.} = \frac{200 \times 3.546 \times 30}{1728} + \frac{30 \times 5 \times 6 \times 3.204}{1728}$$

$= 14$ lb.

Let $B = 2$ in.

$$I_{\text{solid}} = \frac{2 \times 4.5^3}{12} = 15.1875 \text{ in.}^4$$

$15.1875 - 8.8184 = 6.370$ in.^{4}

Let $d = 2.25\,b$ (since $D = 2.25\,B$)

Then $6.370 = .9492\ b^4$

$b = 1.6095$ in.

$d = 3.6214$ in.

$x = .3905$ in.

$z = .4398$ in.

$Z = 3.9193$ in.^{3}

$A = 3.1712$ in.^{2}

$f_b = 3940$ lb./in.^{2}

$f_c = 2523$ lb./in.^{2}

$f_t = 6463$ lb./in.^{2}

Modulus of Rupture $= 6540$ lb./in.^{2}

$$\text{All. } f_t = \frac{3940}{6463}(6540 - 5500) + 5500 = 6135 \text{ lb./in.}^2$$

$f_t/\text{ all. } f_t = 1.052$

Wt. $= 14.02$ lb. with the same amount of blocking as in the case of the 1.5 in. spar.

Final Design

This spar is not quite strong enough since the ratio of $f_t/$ all. f_t is greater than unity. Plotting this ratio against beam width in Fig. 3 shows that a spar of 1.65 width will be just strong enough. The weight of this spar will be 13.8 lb. as shown by the curve of weight on Fig. 3.

This calculation shows that there is little to be gained by increasing the width beyond 1.5 in. although the spar is somewhat too strong. The saving in material would warrant the use of the narrower beam.

The preceding investigation has considered but one special case in the design of airplane wing spars, namely the design of the upper beam of a single bay biplane fixed at its inner end. Naturally the same data may be applied to the lower beams under reversed flight as well as to the spars of a braced monoplane. The proportions for a multiple bay truss follow directly from the single bay and are given below. If however a centrally located pin joint is used for the inner end attachment the above equations will no longer hold. If a pin connection is desired, however, the pin may be so located that the end load, P, will produce a moment in the spar exactly equal to that at the strut point. The connection should be located above the center line for upper wings and below for the lower.

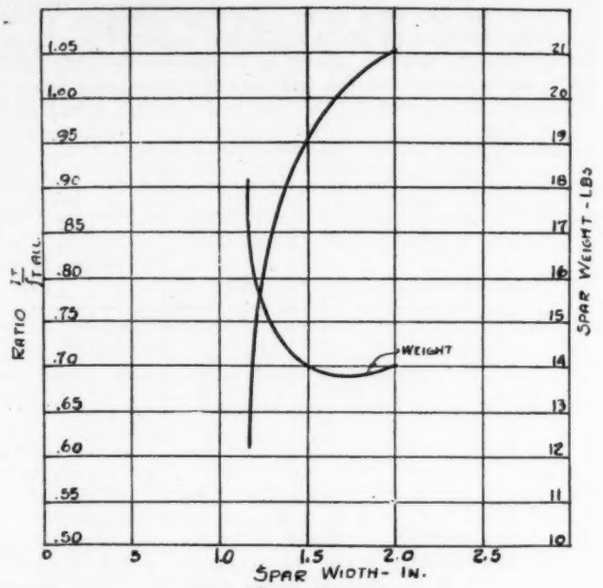


FIG. 3.

When the pin is not eccentric and the moment at the inner end is zero a solution may be reached the same as for the fixed end beam but the value of "y" is quite large (about .75) and the cantilever length becomes very long. This increases the bending stress and consequently the spar weight and also increases the liability of wing tip flutter. The solution of the case of the central pinned beam is not given here because its use would not be recommended. It is not the best arrangement that may be obtained.

Biplane Fixed at Inner End—2 or More Bays

By assumption 2 the maximum Bending Moments are all equal. The outer bay and the cantilever are the same as a single bay truss, the previous problem.

Therefore $L_c = .5513\ L_1$ (6)....

But $L/j = \pi$ for all bays.

And I is constant. .. ..

$$\text{Therefore } L_1 = \pi\sqrt{\frac{EI}{P_1}} \qquad (7)$$

$$L_2 = \pi\sqrt{\frac{EI}{P_2}} \qquad (8)$$

If the bays 1 and 2 be proportioned approximately and the values of P_1 and P_2 determined, formula 9 below gives the value of I, the moment of inertia, then equations 6, 7 and 8 may be solved for the correct bay lengths.

$$S = 1.5513\,\pi\sqrt{\frac{EI}{P_1}} + \pi\sqrt{\frac{EI}{P_2}} \qquad (9)$$

If the dimensions so found do not agree with the estimated strut locations quite closely it may be necessary to repeat the calculation until a satisfactory agreement is obtained. It will be found that a slight change in bay dimensions will have practically no effect upon the values of the various end loads, so that ordinarily but one trial will suffice.

The solution for a multiple bay truss is not so useful as that for the single bay for the reason that the compressive loads are not equal in bays 1 and 2 although the bending moments are equal. This means that the total stress will be greater in bay 2 than in bay 1 and consequently the spar designed closely for the outer bay and cantilever will be too weak for the inner bay and vice versa. This arrangement will not be absolutely efficient. In some cases this difficulty

may be of little importance since as was shown in the example but little weight is saved by using the theoretically ideal beam as against one stressed up but 95 per cent of the allowable. The narrower but heavier section demanded by the inner bay may need so much less blocking at points of attachment of fittings that the total spar weight will be no greater than the ideal beam.

No account has been taken of another condition imposed upon the designer by the Air Service; namely the arbitrary increase of all bending, shear, and compressive loads acting upon the cantilever portion and inward to the outer point of inflection of the outer bay. These loads are all increased by

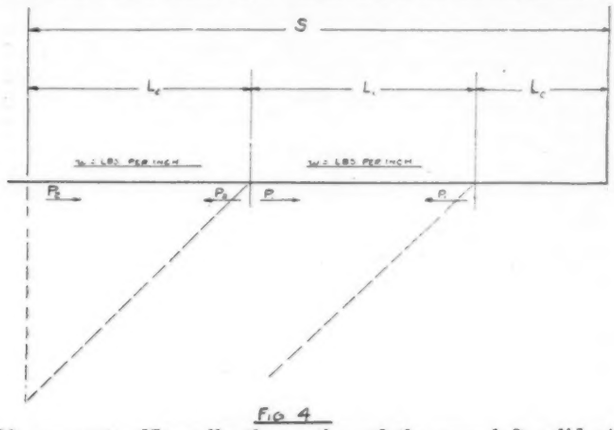


FIG 4

30 per cent. Normally the section of the spar left solid at the strut will have sufficient added strength to take care of this increase.

Airplane wing spars designed by the use of the foregoing formulae may or may not be the lightest possible, no attempt has been made to prove that point. The variation of blocking at strut points with different fitting design makes a theoretical investigation along these lines rather needless. It is the belief of the writer that beams designed by this method will be as light as those designed any other way. At least these equations have the advantage of simplicity and rapidity.

There are numerous other applications of this method of manipulating the precise formulae that should prove both useful and instructive. The writer hopes to have the opportunity of later presenting further papers along these lines relative to the choice of airfoils and also to the determination of the greatest span that can be used with any wing section and load.

**Lecture given before Officers' School, Engineering Division, McCook Field.*

The Miller Field Meet Results

Editor, AVIATION:

I do not know who covered the recent Air Meet of the New York National Guard at New Dorp for your magazine but whoever it was sure got their wires twisted in summing up the seaplane race.

I was tagging about 7 mi. behind Markham's winning VE7 with an Aeromarine 40 Boat equipped with 220 hp. Aeromarine engine. According to Hoyle, I should have been awarded second place and the broken handled teapot, for pushing all those wires through the air at such screaming speed (wires only). Instead this place was awarded to the Stelling amphibian with Pond "up." (Not very far) The Stelling must have been somewhat of a myth for I have been unable to find anyone who saw it in the race. Perhaps I had a narrow escape from colliding with it, but with the superior visibility (?) of the Stelling, Pond must have been enabled to avoid my snaky course.

Perhaps sometime during the 15 min. between the time the VE7 came in and before I showed up the Stelling accidently crossed the finish line as a close second; but when the eyes of the judges become so dimmed as to confuse a 40 boat with a Stelling I would like to be present with a load of 1 cent postage stamps. Perhaps I could effect a trade for dollar bills. Same color sure enough but Oh my! The size.

All in all it was a thrilling race and I still marvel at Caperton's skill and speed in changing spark plugs so fast that, in spite of being dipped in the drink, the C6 starts from the heat of an overheated plug and refuses to be bridled until the N9 was far to the rear. A large crowd saw the VE7 come in. Some of them saw the 40 boat. A few spectators were still on the beach when the Seagull came in and the bathers were wondering what race the N9 was in.

We all had a good time anyway I guess and since I am not addicted to the use of the weed, Pond shouldn't have any future trouble with bent or broken cigarettes.

It really doesn't matter at all but since we already have a report why not have it right in at least one periodical. All papers, etc. contained a similar report to your AVIATION report. If you see fit you might even make a correction in an unobscure lower left hand corner of a rear page of a subsequent edition of AVIATION.

BASIL L. ROWE

The Effects of Shielding the Tips of Airfoils

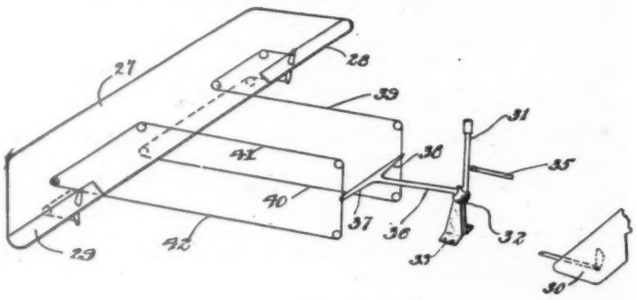
N.A.C.A. Report No. 201

Tests have recently been made at the Langley Memorial Aeronautical Laboratory to ascertain whether the aerodynamic characteristics of an airfoil might be substantially improved by imposing certain limitations upon the airflow about its tips.

All of the modified forms were slightly inferior to the plain airfoil at small lift coefficients however, by mounting thin plates, in planes perpendicular to the span, at the wing tips, the characteristics were improved throughout the range above three-tenths of the maximum lift coefficient. With this form of limitation the detrimental effect was slight; at the higher lift coefficients there resulted a considerable reduction of induced drag and, consequently, of power required for sustentation. The slope of the curve of lift versus angle of attack was increased.

Report No. 201, by Elliott G. Reid, may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

Interconnected Aileron and Elevator



The above sketch illustrates a patent taken out by Dennis F. Cashman, of Dayton, Ohio, the purpose of which is to interconnect the elevator and ailerons of an airplane. When the control stick is pulled back the elevator is raised as in normal practice and at the same time both ailerons are lowered. This produces the same effect as the Fairey or de Haviland flaps, that is, it increases the angle of incidence of the wings, causing the machine to rise and also, due to the greater resistance, causing it to slow down somewhat. The center of pressure also moves slightly forward tending to accelerate the upward pitch of the machine. The ailerons act in the normal manner and the device is to be recommended for its simplicity. The exact aerodynamic results of such an arrangement are hard to foresee. Flaps have considerable advantages but connecting them with the elevators might have certain disadvantages which would counteract the advantages. The device, however, would be very simple to try out and even if unsuccessful the results would be interesting.

"Who's Who in American Aeronautics"

The second edition of "Who's Who in American Aeronautics" will be published Sept. 1, 1925. Below will be found new biographies that will appear in the forthcoming volume. An invitation is extended to all pilots actively engaged in aviation military, naval or commercial to send their biographical sketches for insertion in the next issue. The book will contain the biographies of practically all the leading persons in American aeronautics. The price of the book will be two dollars. Orders are being taken in advance as the edition is limited.

Charles Albert Van Dusen

VAN DUSEN, CHARLES ALBERT, Aircraft Manufacturing; born, Thorpe, Wis., Oct. 17, 1888; son of Charles Albert Van Dusen and Mary Frances (Malone) Van Dusen; married, Wanda V. Eldred, Jan. 1, 1914.

Educated: Grade school, Ottawa, Can.

Professional: E. B. Eddy Co., 1902 to 1909; Sterling Engine Co., 1909-1910; E. R. Thomas Motor Car Co., 1910; E. B. Eddy Co., 1910-1911; Little River Redwood Co., 1911-1912; Southern Pacific Railroad, 1912-1913; Hydraulic Co., 1914 to present date; The Glenn L. Martin Co., Los Angeles, Calif., aircraft Construction, 1914-1915; Tool room foreman, 1915-1916; Master mechanic, 1916-1917; The Glenn L. Martin Co., Cleveland, O., Tool engineer and production mgr., 1917 to 1923; Factory Mgr., 1923 to present date.

Present Occupation: Vice-Pres. and Gen. Mgr., The Glenn L. Martin Co., Cleveland, Ohio.

Address: 16800 St. Clair Ave.; home, 17905 Ingleside Road, Cleveland, Ohio.

Cyril C. Caldwell

CALDWELL, (Cy.) Cyril C., Test Pilot; born, Bridgetown, Nova Scotia, Jan. 13, 1892; son of Wesley Caldwell and Annie Florence (Cassidy) Caldwell; married, Myrle Mable Rumble, Dec. 25, 1920.

Educated: Graded schools and Newton High School.

Professional: Bank of Nova Scotia, 1908 to 1914; Theatrical Manager, 1914-1915; Exhibition flying, 1915-1916.

Aeronautical Activities: Exhibition flying, New England States 1915-1916; joined R.F.C., Nov. 1916; graduated May 1917; attached Northern Home Defense Area, England, on Zeppelin Patrols until Sept. 1917; joined 102 Sqd., France, Night Bombing until July 1918; returned to England and posted to Training Division, Cranwell, England; instructed in night flying until Armistice; posted to 49 Communication Sqd., Bavai, France and Cologne; demobilized, Sept. 1919; joined Canadian A.F. as Reserve Officer, 1920; Air Board, Canada 1920 to 1922; Test Pilot for Glenn L. Martin Company, since June 1923.

Flying Rating: R.F.C. Cert. No. 4756, May 30, 1917; Canadian Air Bd., Commercial Air Pilot Navigator's License No. 172, Feb. 24, 1922; F. A. I. Cert. 6161, Sept. 16, 1924.

War Service: Nov. 1916 to Sept. 1919 with R.F.C. later R.A.F.

Member: N.A.A.

Present Occupation: Test Pilot, Glenn L. Martin Company.

Address: 16800 St. Clair Avenue, Cleveland, Ohio; home, 14300 Lake Shore Blvd., Cleveland, Ohio.

William Ellwood Doherty

DOHERTY, WILLIAM ELLWOOD, Commercial Aviation; born, Buffalo, N. Y., Dec. 7, 1888; son of William D. Doherty and Octavia (Field) Doherty; married, Glayds Champlin, Feb. 24, 1916.

Educated: Ridley College, St. Catherines, Ont., University of Toronto; Science Course. '10.

Professional: Thomas Motor Car Co., 1906 and 1910; Sales Mgr. Burgess Aeroplane Co. 1916-1917; Sales Mgr. Myles Salt Co., New Orleans, 1920 to 1925.

Aeronautical Activities: Entered Curtiss Flying School, May 1911; exhibition pilot, McCurdy-Willard Aeroplane Co., 1911; instructor and test pilot Curtiss Aeroplane Co., 1912 to 1914; organizing Italian Naval Aviation School, Taranto, Italy; instructor and patrol flying 1914 to 1916; testing for Curtiss Co., Spain, 1916; test pilot, Burgess Aeroplane Co., 1916-1917.

Flying Rating: Hydroplane License No. 7; Naval Aviators Designation No. 427; Italian Superior Hydro, 1915.

War Service: Lt., U.S.N.R.F., 1917.

Honors: Cavaliero, Order of the Crown of the King of Italy.

Member: Aero Club of New England; the Saturn Club (Buffalo).

Present Occupation: Sales Mgr. Airships, Inc.

Address: Hammondsport, N. Y.; home, Lake St., Hammondsport, N. Y.

Elmer Haslett

HASLETT, ELMER, Investments; born, Cartersville, Mo., Feb. 24, 1894; son of John Franklin Haslett and Josie Bailey (Jones) Haslett; married, Priscilla Miles, March 6, 1923.

Educated: New Mexico Military Institute, 1914; U. of So. Calif., LLB., 1917; Georgetown U., LLM., 1920.

Professional: V. P., R. P. Sherman Corp.; V. P., Mexican Finance and Investment Co.; V. P., American Chemical Co.; V. P. Radium Ore Co.,; Director, Wells Fargo & Co. of Mexico.

Aeronautical Activities: 1917, Commissioned, 1st Lieut., Air Service; Aerial Observer; operations officer, 12th Aero Squadron, A. E. F.; Operations officer, 1st Army Corps, Chateau Thierry, St. Mihiel and Argonne; 1919-20, Aide to Brig. Gen. Wm. Mitchell.

Flying Rating: J. M. A.

War Service: as above; Awarded D. S. C.; Croix de Guerre; two special citations by Gen. Pershing, "For conspicuous bravery and meritorious service."; Lieut., 1917; Captain, 1918; Major, 1919; Resigned, Sept. 30, 1920.

Books Written: Luck on the Wing, (E. P. Dutton Co.)

Member: University Club, (Wash., D. C.); Country Club, Mexico City.

Present Occupation: V. P., Mexican Finance and Investment Co.

Address: 260 California St. San Francisco, Calif.; home, 2130 Leavenworth St., San Francisco, Calif.

William N. Hensley, Jr.

HENSLEY, WILLIAM N., Jr., Major, Air Service; born, Columbus, Nebraska, Oct. 18, 1881; son of William N. Hensley and Margaret Anna (McAllister) Hensley; married, Matie Merle Manard, July 10, 1908.

Educated: Grammar and High Schools of Columbus, Neb.; U. S. M. A., West Point, '08.

Professional: Mounted Service School, 1912; C. O., Ross Field, Arcadia, Cal., Feb. to Nov. 1918; C O., Langley Field, 1920-1921; School of the Line, 1922; General Staff School, 1923; 1923 to 1925 C.O., Mitchel Field.

Aeronautical Activities: American Observer British Airship, R34, Trans-Atlantic flight 1919; First American to make non-stop flight from U. S. to Europe.

Flying Rating: Spherical Balloon Pilot, 1918, No. 321:; Balloon Observer, 1918; A. P., 1919, No. 4148; Dirigible Balloon Pilot, 1919, No. 107

War Service: Maj. Sig. Corps, Aug. 5, to Feb. 25, 1918; Lieut. Col. Sig. Corps Feb. 26 to Aug. 19, 1918; Col. Sig. Corps, Aug. 18, to June 30, 1920.

Member: Hon. member Cherry Valley Club; Meadow Brook Club; 32nd Degree Mason, Shriners.

Present Occupation: Major, Air Service.

Address: War College, Washington.

Lorillard Spencer

SPENCER, LORILLARD, Manufacturer; born, New York, July 4, 1883; son of Lorillard Spencer and Caroline S. (Berryman) Spencer; married Katherine E. Force, Dec 6, 1922.

Educated: St. Paul's School, Concord, N. H.; Columbia University.

Professional: Formed Pedersen Mfg. Co., (Automobile parts, etc.), 1906; Organized several other companies; Pres. Austral Windsor Co.; Somma Shops, Inc. 63rd St. Corp.; Director, Advocate Realty Corp.

Aeronautical Activities: Official at Belmont Park Air Meet, 1910; Director, Witteman Aircraft Co.; Pres., Atlantic Aircraft Corp.

War Service: Major 369th Inf. (15th N. Y. Inf. N. G.)

Honors: Distinguished Service Cross; Legion of Honor; Croix de Guerre with Palm; 1 gold, 1 silver star.

Member: S. A. E.; Union Club; N. Y. Yacht Club; Columbia University Club; Delta Phi Club; Piping Rock Nat. Republican Club.

Present Occupation: Pres. Atlantic Aircraft Corp.

Address: 383 Madison Ave.; home, 36 East 82nd St., New York City.

Odis A. Porter

PORTER, ODIS A., Electrical Engineer; born, Indianapolis, Ind., Sept. 2, 1872; son of William Porter and Mary J. (Kreag) Porter.

Educated: Grade and High Schools.

Professional: Morman and Perry Light Co., 1889 to 1893; Indianapolis District Telegraph Co., 1894 to 1904; Porter-Vestal Electric Co., 1905 to 1911; Porter Electric Co., 1912 to 1925.

Aeronautical Activities: Official timer for National Aeronautic Ass'n. of U. S. A., and Federation Aeronautique Internationale, Paris France, Races timed by electric timing machine at Detroit, Mich.; Detroit Aerial Water Derby, Oct., 7-8, 1922; National Airplane Races, Selfridge Field, Mt. Clemens, Mich., Oct. 12-16, 1922; McCook Field, Dayton, Ohio, Aerial Derby and Speed trials, March 29 to April 17, 1922; International Air Races, Lambert Field, St. Louis, Mo., Oct. 3-6, 1923; Aeronautic Meet, Miami, Fla., March 6-7, 1924; Aerial Derby, Wilbur Wright Field, Dayton, Ohio, Oct. 2-4, 1924; International Air Races, Wilbur Wright Field, Dayton, O., Oct. 2-4, 1924; Aerial Derby, Wichita, Kans., Oct. 10-11, 1924; Jacques Schneider Cup Race; Baltimore, Md., Oct. 23 to 25, 1924.

Member: Indianapolis Athletic Club; Optimist Club

Present Occupation: President Porter Electric Co.

Address: 215 Hudson St., Indianapolis, Ind.; home, 1915 Central Ave, Indianapolis, Ind.

Ralph Pulitzer

PULITZER, RALPH, Newspaper Publisher; born, St. Louis, Mo., June 11, 1879; son of Joseph Pulitzer and Kate (Davis) Pulitzer; married, Frederica V. Webb, Oct. 14, 1905.

Educated: St. Marks; Harvard, 1900, A. B.

Professional: Newspaper work; reporter, editorial writer; business office; publisher of "The World" (N. Y.)

Aeronautical Activities: Donor with Joseph Pulitzer of Pulitzer Trophy.

Books Written: "Over the Front in An Aeroplane."

Member: Harvard; Author's; Player's; Army and Navy.

Present Occupation: Pres., Press Publishing Co.

Address: 65 Park Row, New York; home, 7 East 73 St., New York.

William D. Tipton

TIPTON, WILLIAM D., Mechanical Engineer; born, Jarrettsville, Md., Dec.11, 1892; son of Alfred S. Tipton and Mina J. (Duncan) Tipton; married, Elizabeth M. Barrett, Dec. 28, 1920.

Educated: Western Maryland College, A. B., '10; John Hopkins, Univ. B. S., '20.

Professional: Gas and Electric Co., 1910; Kline Motor Car Co., 1911; Carl Spoerers Sons Co., 1913; Bosch Magneto Co., 1915; 1916 to 1920, student John Hopkins Univ.; Baltimore Evening Sun, 1919 to date, conducting aerial photographic and aeronautical news service.

Aeronautical Activities: S. M. A., Ohio State Univ., May 1917; overseas, Aug 1917 to S. M. A. Oxford Univ., attached Royal Air Force; No. 1 Training Depot Station, Stamford, England, Nov. 1917; Scout Training Squadron, Wye, Kent; Aerial Gunnery School, Turnberry, Scotland, Feb. 1918; Commissioned 1st Lieut., Feb. 20, 1918; Fighting School, Ayr, Scotland. Feb. 1918; No. 3 Squadron, R. A .F., France, March, 1918; 17th U. S. Squad. attached to R A F., June 1918; Prisoner of War, Aug 26, 1918. Discharged, Feb. 1919; commissioned Captain ASORC; Captain, Air Service, Maryland National Guard, Mar. 29, 1921; Major, A. S. M. N. G., Oct 1, 1924; C O., 29th Division Air Service, M. N. G., Oct. 1, 1924.

Flying Rating: R. M A., Feb. 20, 1918

Honors: Distinguished Flying Cross, Great Britian.

Member: Flying Club of Baltimore, Secretary, 1919 to date.

Present Occupation: Baltimore Evening Sun and commercial aviation.

Address: 711 Keyser Bldg., Baltimore, Md.; home, Catonsville, Md.

New York-Chicago Night Air Mail

Post Office Department Starts New Service to Save a Business Day Between New York and Chicago

On July 1, the first anniversary of the transcontinental service, the Post Office Department inaugurated a night air mail service between Chicago and New York. This service has been demanded by the business interests of both cities for a long time and would have been incorporated in the thorough-going transcontinental service, had the geographical situation been different. The benefits of this new service are not limited to Chicago and New York, however. AVIATION received a letter from Milwaukee post marked 5.00 p. m. July 1 in that city, in the first delivery July 2.

The departures of the first planes were made the occasion of great public gatherings. In Cleveland, the transfer of the mail from one plane to another was made the culminating event of the ceremonies incident to the opening of the Municipal Airport. Probably a quarter of a million people attended the start or passage of the first planes over the route. At Cleveland, New York and Chicago extra details of police were required to keep the public from overwhelming the pilots and planes.

New York

Because of an exceptionally heavy mail, caused by a large number of souvenir letters from New Yorkers to relatives, business associates and friends in Chicago, two planes were dispatched from Hadley Field. The first plane was sent ahead of scheduled time and left the field at 8.47 p. m., Eastern Daylight Saving Time. The regular schedule commenced with the departure of the second plane at 10.30 p. m.

The first plane was piloted by D. C. Smith, a veteran of the Cheyenne-Chicago night run of the transcontinental air mail service. It carried three sacks of mail weighing eighty-seven pounds. It was followed two hours later by a second plane loaded with thirty-six mail sacks and piloted by J. D. Hill. The mail load of the second plane was well over two hundred and fifty pounds.

Congressman L. H. LaGuardia, flying exponent of air power, arrived at Hadley Field from Langley Field, Va., in a Martin bomber piloted by Lieut. John M. Davis. As soon as mail pilot J. D. Hill had disappeared westward with the second load of Chicago mail Mr. LaGuardia climbed aboard the bomber and was soon headed south to Langley Field with a three quarter moon furnishing the only illumination for the route.

The twin Liberty Sikorsky passenger plane, piloted by Charlie Collyer, formerly of the air mail, flew over from its Long Island field with 12 aboard, including Col. Harold E. Hartney, head of the General Airways and newspaper correspondents.

Frank H. Russell, vice-president, and C. E. Gilmore, chief engineer of the Curtiss Company, flew over from Garden City in a Curtiss Oriole piloted by Gilmore. The following morning they expected to fly to Washington on business of the Curtiss company.

A Contrast

Then a page blown from the book of ancient American aviation fluttered out of the darkness into the glow of the 500,000,000 candle power flood light. It was an irrepressible Jennie. The pilot landed and then taxiied to the far boundary away from the crowd—a reminder to impatient enthusiasts that aviation after all has progressed since the first Jennie took the air.

And bearing on aviation progress Chas. H. Colvin, General Manager of the Pioneer Instrument Company, remarked that the present epochal date in commercial aviation marked also his entry into the field—with the Curtiss Motor Co. of Hammondsport. back in 1913. Two streamlined pioneer landing searchlights are attached to the upper surfaces of the lower wings of each night mail plane.

W. Wallace Kellett of Philadelphia, American representative of Farman planes, Anzani engines and the B. B. T. Corp., the latter builders of the B. B. T. flood lights which illuminate the main air mail fields between New York and Chicago, explained the working of the 500,000,00 c. p. Hadley field light. At the time, the great light was being used by a swarm of news photographers to get the usual movies and stills without which no aviation ceremony can successfully take place. It is said that a pilot may land directly facing the lens of the B.B.T. light.

Just before he helped load the mail sacks into the second plane Postmaster New said that while the Government was determined to continue the night air mail service, he felt that it could never be made to pay if operated with mail solely.

"It must be operated with freight and express to become a paying proposition," he said, "and I would like to see private companies carrying the mail under contract with the Government, as the railroads do now."

The Postmaster General talked of the vast changes in the postal service that have come into effect within a comparatively few years. He recalled the days when the pony express rider rode from town to town along the Western frontiers carrying the mail in a sack strapped to his saddle, and said that it seemed hard to realize that a letter posted in New York one afternoon would be delivered in Chicago shortly after breakfast the next morning.

With Mr. New were Congressman Randolph Perkins of New Jersey, Roger Williams, Superintendent of the Second District of the Railway Postal Service; Postmaster John J. Kiely of New York, Mayor Morrison of New Brunswick, Postal Inspector Charles H. Clarahan of New York, and P. P. Kirkham. Field Manager at Hadley Field, in the absence of Capt. J. E. Whitbeck, Superintendent of Air Mail of the Eastern District.

Cleveland

At least 200,000 were lucky enough to get within sight of the Cleveland airport, where they could at least see the shimmering spread of the great, floodlights and hear the roar of the engines. Nobody will ever know, for Traffic Commissioner Edward J. Donahue would not even venture a guess, how many tried to get out to the airport and gave it up as a hopeless task.

It was the most tremendous demonstration of public interest within the memory of the oldest Cleveland officials. The great throng which stormed the airport was only a small part of those taking part.

All day long the field was crowded with people going out to see the extraordinary exhibition of aircraft—the army pursuit planes, the big Douglas planes like those the round-the-world fliers used, the Martin bombers made in Cleveland, the big gray Stout monoplanes and the air mail's yellowish old De Havilands. But the real feature of the whole day was the businesslike arrival and departure of the mail fliers.

Lieut. J. T. Hutchison of McCook Field was thousands of feet in the air performing illuminating spirals when the signal was flashed to him to come down and clear the way for the first plane from Chicago.

Among the visiting planes at the Cleveland Airport were: a Fokker Monoplane from Detroit: Yvon Milre's Aeromarine; Ralph Thomas's Curtiss; a Martin Bomber from Selfridge Field; another Martin Bomber, equipped for night flying, from McCook Field; the Bernice II of the Detroit Airways; three pursuit planes from Selfridge Field; Phil Goembel's Waco from Chippewa Lake; General Patrick's

DH; V. C. Babcock and Guy McLaughlin from Akron in a Curtiss; Joseph Esch in a Curtiss from Turkeyfoot Lake; a Vought from Dayton, rigged for a fireworks display; a Laird from Detroit; another Vought from Dayton, equipped for night flying; Art Smith with a Martin Commercial; a Douglas Transport from McCook Field; two DH's from McCook Field; a Curtiss PW8 from McCook; a Navy monoplane from the Martin Field; another Martin Commercial; another Vought from Dayton; a Stout all-metal Air Pullman from Detroit; a Martin Commercial from New York with a load of gowns for a local store; Casey Jones in a Curtiss Oriole with William Arthur and the Spalding Construction Company's payroll.

Chicago's first plane took the air at 7.48 p. m., Chicago time. It was piloted by Shirley J. Short a veteran of the service, and at 10.30, eastern standard time, also Chicago daylight saving time—less than 3 hr. after it took the air here—the ship was reported as landed in Cleveland—and only fourteen minutes was consumed in transferring the mail from the original plane to another, for at 10.44, Pilot P. Collins left on the second leg to New York.

Police and special guards had difficulty at Maywood Field with the crowd. The thousands who gathered west of Maywood surged closely around the ships until almost the moment of departure.

Postmaster Arthur C. Lueder, Paul Henderson, second assistant postmaster general, and C. F. Egge, General Superintendent of Air Mail, were among the prominent persons in the send-off of the two first night planes leaving Chicago for the east. The crowd gathered about them as they stood by Pilot Short's ship discussing the flight with him and bidding him good luck.

Almost at the last moment before Pilot Short's departure two large boxes of flowers arrived from the downtown postoffice to be put aboard the plane. One of these proved to be a box from Vice-President Charles G. Dawes to Col. John Coolidge, father of the President, who is convalescing after an operation. It was addressed to Col. Coolidge at Plymouth, Vt.

The other box was for Miss Grace George, actress, and addressed to her New York residence. It was sent by the radio station, WHT, from which the ceremonies, including speeches by Vice-President Dawes and Mr. Henderson, were broadcast.

When Pilot George Meyer hopped off at 9.40 Chicago time, it was much the same, except that the sun had set, and the field was flooded by lights. Many of the crowd remained to see the second take-off.

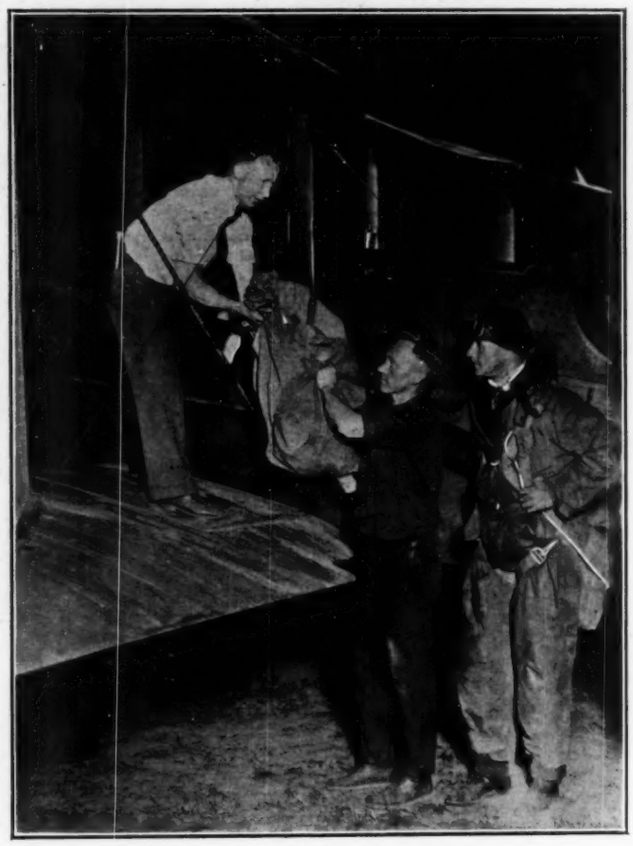
The transcontinental service, which dramatized the progress of the infant air mail, may soon be discontinued, Colonel Henderson hinted in his speech. It doesn't pay.

"To link New York and San Francisco we must cross hundreds of miles of desert and mountains," said Colonel Henderson. "We touch towns of little importance. And when it is all done little has been accomplished. New York and San Francisco have not much in common. In New Jersey, for example, they've never heard of San Francisco; in California they don't know where Newark is."

The Route

The schedule on the transcontinental route was based on a combination of geographical and weather conditions, comprising prevalent fogs at both ends of the route, the two coastal mountain ranges, and the flat level country in between, ideal for night flying. Groping the way, with no precedents for guidance, it was inconceivable that the mountainous sections could be chosen as the scenes for first experiments in night flying. Of necessity, therefore, the amount of available mail traffic became a matter of secondary consideration. Yet, while actual problems of operating night and day between New York and San Francisco were still unsolved, Colonel Henderson began preparations for the New York-Chicago overnight air route.

The pilot departs secure in the knowledge that what appears to be a wall of darkness before him has been rendered comparatively safe by a series of 150 beacons scattered along the 754 mi. to Chicago. The field he has just left remains brilliantly illuminated. The hangars, towers, wind cone, et cetera, all are flood lighted. Atop the largest hangar, some 50 ft. from the ground, is a huge 5,000,000 candle power electric beacon set about one degree above the horizon and making a complete circuit six times a minute. Some 12 to 18 mi. westward a sister beacon of similar magnitude sends intermittent flashes to the pilot and conveys to him the satisfying information that an emergency landing field, outlined with boundary lights, is awaiting him in the event of trouble.



International Newsreel Photo

Unloading the first night air mail to be received in New York from Chicago. Pilot Paul (Dog) Collins at the right

For 80 mi. he roars his way almost due westward before he encounters the Blue Ridge Mountains at New Tripoli. For the next 30 mi. he is in the midst of what has been declared to be the most dangerous flying country in the world. The mountains, though not more than 2,600 ft. high, are almost without exception heavily timbered. Their conformation is such that even where there is no timber the open spaces so frequently found in the Rockies and not entirely absent in the Sierras, are practically non-existent. In this 30 mi. stretch from New Tripoli to Ringtown, the air mail service has laid out five emergency landing fields, each of which has a five-million candle-power beacon, with routing beacons between to guide the flier on his course.

The following is the sequence from East to West of the Emergency Landing Fields and In-Between Lights of the air mail airway, New York to Cleveland. Emergency Fields are shown in CAPITAL LETTERS.

No.	*Field or Light*
1.	HADLEY FIELD, NEW BRUNSWICK, N. J. (New York Terminal)
2.	Somerville Light, Somerville, N. J.
3.	WHITEHOUSE, N. J.
4.	Cushetunk Mountain Light, Annandale, N. J.
5.	Musconetoong Mountain Light, West Portal, N. J.
6.	STEWARTSVILLE, N. J.
7.	Farmersville Light, Easton, Pa.
8.	NORTHAMPTON, Pa.
9.	Schnecksville Light, Catasauqua, Pa.
10.	JORDAN, Pa.

11. Blue Ridge Light, New Tripoli, Pa.
12. ANDREAS, Pa.
13. Mauch Chunk Ridge Light, Tunaqua, Pa.
14. HOMETOWN, Pa.
15. PARK PLACE, Pa.
16. RINGTOWN, Pa.
17. RING MOUNTAIN FIELD, Ringtown, Pa.
18. NUMIDIA, Pa. (Semi-Terminal)
19. Catawissa Light, Catawissa, Pa.
20. ELYSBURG, Pa.
21. Snydertown Light, Snydertown, Pa.
22. SUNBURY, Pa.
23. New Berlin Light, Mifflinburg, Pa.
24. HARTLETON, Pa.
25. Laureltown Light, Millmont, Pa.
26. WOODWARD, Pa.
27. Millheim Light, Center Hall, Pa.
28. BELLEFONTE, Pa. (Operating Field)
29. Alleghany Mountain Light, Wingate, Pa.
30. SNOWSHOE, Pa.
31. Moshannon Mountain Light, Winburne, Pa.
32. KYLERTOWN, Pa.
33. Bigler Light, Bigler, Pa.
34. CLEARFIELD, Pa.
35. GREENWOOD CLUB FIELD.
36. ROCKTON, Pa.
37. ? Location not selected. Rockton, Pa.
38. DUBOIS, Pa.
39. Reynoldsville Light, Reynoldsville, Pa.
40. BROOKVILLE, Pa.
41. Corsion Light, Brookville, Pa.
42. CLARION, Pa. (Semi-Terminal)
43. Shippensville Light, Shippensville, Pa.
44 LAMARTINE, Pa.
45. Pittsville Light, Rockland, Pa.
46. KENNERDELL, Pa.
47. WESLEY, Pa.
48. MERCER, Pa.
49. Clarksville Light, Franklin, Pa.
50. HARTFORD, Ohio.
51. Cortland Light, Cortland, Ohio
52. PARKMAN, Ohio.
53. Auburn Center Light, Solon, Ohio.
54. SOLON, OHIO.
55. Garfield Heights Light, Cleveland, Ohio
56. CLEVELAND, OHIO. (Terminal Field)

The pilots chosen for the overnight service are among the most expert to be found in any aviation service in the world. The air mail service employs altogether some 50 pilots, not one of whom but has had years of flying experience and some literally hundreds of thousands of miles in the air. They are well-paid, have a high sense of responsibility and above all are possessed with that spirit of the service which assures getting the mail through whenever physically possible.

The pilots assigned to the New York-Chicago overnight service are:

Flying from Hadley Field to Cleveland—W. L. Smith, J. D. Hill, D. C. Smith, and H. A. Chandler.

Flying from Cleveland to New York—P. F. Collins, C. H. Ames, L. F. Bertaud, and E. F. Ward.

Flying from Cleveland to Chicago—W. D. Williams, Art Smith, R. H. Ellis, and J. F. Milatzo.

Flying from Chicago to Cleveland—G. I. Meyers, S. J. Short, J. O. Webster, and H. J. Brown.

Between New York and Cleveland, which embraces all the mountainous territory on the route, are 32 landing fields which serve as havens of refuge. In between, on 30 to 50 ft. towers, are routing beacons consisting of four head lights of the type used on Ford automobiles, one adjusted to cast a beam of light half a degree above the horizon, one at one degree, another at a degree and a half, and the fourth at two degrees. The cluster, revolving at six times a minute, is surmounted by a stationary red light, to indicate to the pilot that the light is a routing beacon and not an emergency field light. No matter at what altitude the pilot is flying, if visibility is possible at all, he will come within range of one of the Ford lights as a result of the variation in beam angle.

Superintendent J. E. Whitbeck of the Eastern Division, to whom was entrusted the work of laying out and operating the great undertaking, was confronted with many problems in the mapping out of a safe route between New York and Cleveland, over the Alleghenies. Confined to a line not more than three miles in width, it was necessary to pick locations for emergency landing fields on this narrow strip comparatively free from timber and easy of access. They must be well-drained while another rather important feature is their availability for leasing. Since considerable of the land is in the mountain region has no farming value but is held only for coal and timber rights, the owners are scattered all over the country and Mr. Whitbeck, to obtain leases, was forced to travel from one end of the country to the other.

Another important feature entering into the location of the lights and fields was the necessity for placing beacons where there would be the least possible danger of their being obscured either by ground fogs or by low hanging clouds for which the region is noted as a result of converging storms from the Atlantic seaboard and the Great Lakes. When it was learned that these two weather phenomena never occurred simultaneously, a solution for the problem was found in the alternation of lights between the mountain tops and the valleys so that when the mountain light was obscured by clouds the one in the valley would be visible, while the reverse would be true when clinging fogs hid the lower light.

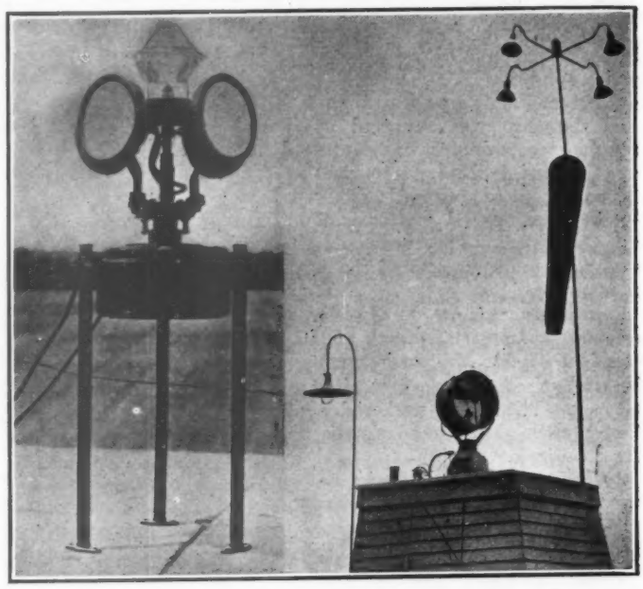


Photo Kadel and Herbert

At the left; one of the revolving route beacons. At the right; the beacon and illuminated wind cone on the hangar at Hadley Field

For months Mr. Whitbeck kept a check on weather reports so that no meteorological condition likely to cause embarassmen to fliers would be overlooked and steps taken to checkmate it. At each of the 32 landing fields between New York and Cleveland are caretakers trained to make weather observations and report to headquarters conditions of the winds, clouds, barometer, et cetera.

The five main fields on the route, that is, Hadley, Bellefonte, Cleveland, Bryan, and the Maywood Field at Chicago are equipped with radio stations, and all ships of the air mail service are dispatched in and out by radio. Formal service orders are handled in the same fashion. Each emergency field is connected by direct telephone wire with the nearest terminal field. Should it become necessary to warn a pilot or call him down, he will be signalled by a simple code system of flares. One brilliant red magnesium flare means "Bad weather ahead; exercise caution." Two such flares constitute an imperative order to the pilot to alight and wait for further instructions.

As they fly westward over the lighted airway pilots carry sufficient fuel, oil and water to take them to Bellefonte, where they are completely serviced. At Cleveland another plane and another pilot continues the westward journey. He in turn stops at Bryan, Ohio, for fuel. Eastward the process is reversed.

One of the most interesting, as well as important features of the equipment for night flying is the half billion candle power electric arc flood lights with which the five major flying fields are equipped. So powerful is tnis light that the landscape for nearly a mile around in a complete half circle is made as light as day. A newspaper may be read with ease at three-quarters of a mile away yet the rays at no point extend more than fifteen feet above the ground and there is no blinding glare to confuse incoming pilots.

The Woodson Foto

Description of a New Commercial Three-Seater Machine Powered with a Salmson Z9 Engine

The Woodson Engineering Co. of Bryan, Ohio, has recently started production of a new commercial plane known as the Foto. Some of the note-worthy features of this plane are its convertible cargo space which can be changed almost instantly from a very comfortable passenger compartment into a mail or express compartment by simply folding the seats back out of the way.

The upper main plane is butted together and joined with plates, and is supported with four cabane struts at 45 deg. angle from the fuselage. The lower wings are attached directly to the fuselage. Both wings are braced with a single bay of struts, double flying wires and single landing wires. Ailerons are placed on all four wings. The aileron control wires are placed inside of the wings with windows for inspection. The spars are of solid spruce routed to I section. The ribs are of veneer cut out for lightness and covered with a spruce cap strip. Internal bracing is by double heavy steel rods. A strong veneer side wall 18 in. wide extends the entire chord of the wing.

The fuselage is of wood construction throughout, and is covered with 0.125 in. three ply birch veneer glued with water proof glue and screwed to fuselage. This type construction has been used in the Air Mail Service for many years and has proven to be very reliable. The engine cowling is made of 16 gage aluminum and is put on in two halves with quick detachable fasteners, which makes it readily removable, and gives complete access to the engine. The pilot's compartment is very roomy and comfortable, and affords excellent visibility. Controls are placed within easy reach and in the most convenient place. The dash is finished mahogany and is equipped with modern navigating instruments. The seats and cockpit openings are upholstered with dark blue leather. A wide, detachable windshield is placed on the front cockpit when it is used for passenger work.

The empennage is constructed of part wood and part steel tubing, making it a very strong unit. The elevators, rudder and vertical fin are all built of wood with metal horns for operating. The control wires are all inside the fuselage as much as possible. The rudder is balanced, and is large enough to be very effective on the ground when taxiing.

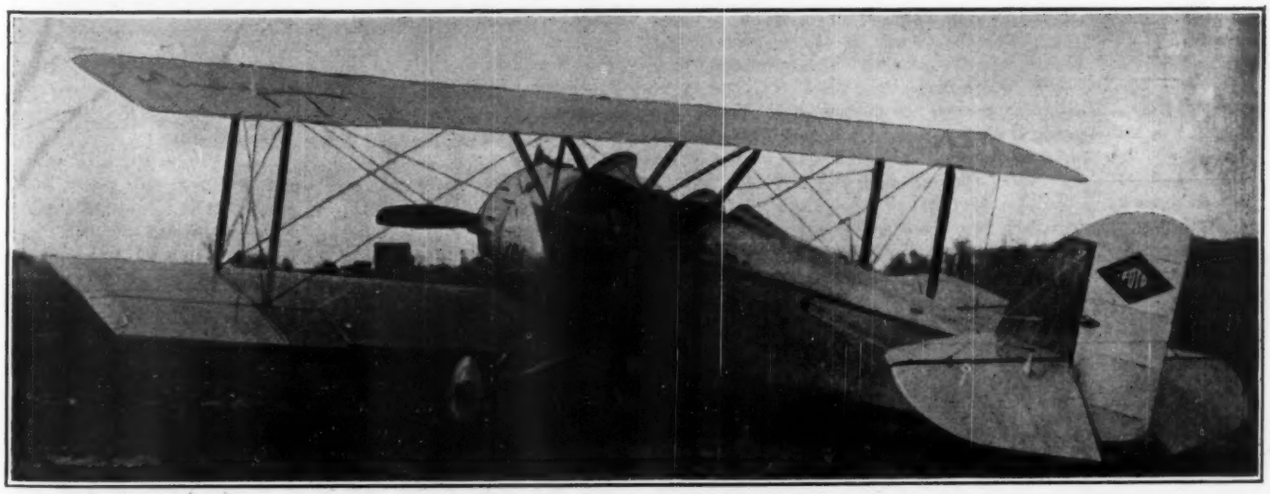
The landing gear is built of steel tubing streamlined with balsa wood, and is strong enough to withstand very rough treatment. It is designed to use elastic cord wrapped in such a manner that a new one can be replaced in a very few moments. The tail skid is of the leaf spring type with a changeable shoe, the builders find that this type skid is the most efficient type as it eliminates wrapping shock cord, breakage, etc., 750 x 125 mm. wheels are used.

The finish of the Foto is a combination of aluminum, navy blue and natural wood, all surfaces being treated with two coats of clear and two coats of aluminum pigmented dope and two coats of Valspar varnish. All external fittings are lacquered navy blue. The fuselage and struts are finished natural with four coats of white shellac and two coats of Valspar varnish.

The engine used is the Salmson type Z9 260 hp. nine cylinder water-cooled radial, of which type the manufactures of the Foto control the entire quantity in the United States. This engine proved to be very reliable during the world war. It is ball bearing throughout, and with proper care will run 500 hr. without an overhaul, which is something to be considered in the cost of operation.

SPECIFICATIONS

Length overall	23 ft. 3 in.
Height overall	9 ft. 2 in.
Span upper wing	29 ft 6 in.
Span lower wing	29 ft 6 in.
Chord upper wing	5 ft. 6 in.
Gap at fuselage	6 ft. 0 in.
Gap at wing tip	5 ft. 1 in.
Stagger	None
Airfoil (wing section)	R.A.F. 15
Angle of incidence upper	3 deg.
Angle of incidence lower	3 deg.
Sweep back	None
Dihedrai upper wing	None
Dihedral lower wing	3 deg.
Angle of ship resting on grd.	18 deg.
Span tailplane	10 ft. 2 in.
Area of wings including ailerons	311 sq. ft.
Area of ailerons	33 sq. ft.
Area of tailplane	10.3 sq. ft.
Area of elevators	19.8 sq. ft.
Area of rudder	10.3 sq. ft.
Area of fin	3.7 sq. ft.
Track of wheels	6 ft. 2 in.
Wing loading	8.54 lb./sq. ft.
Power loading	10.21 lb./hp.
Fuel capacity	85 gal.
Endurance at cruising speed	5 hr.
Range	400 mi.
Maximum speed full load	130 mi./hr.
Climb, full load to	
1,000 ft	1 min. 0 sec.
2,000 ft.	2 min. 15 sec.
5,000 ft.	6 min. 10 sec.
10,000 ft.	14 min. 0 sec.
Service ceiling	18,000 ft.
Absolute ceiling	20,000 ft.
Weight empty	1,420 lb.
Useful load	
Fuel and oil	600 lb.
Crew	180 lb.
Pay load	2,655 lb.
Total weight full load	455 lb.



One half rear view of the Woodson Foto

The M.I.T. Aeronautical Course

The Pioneer American Course in Aeronautical Engineering

The need for specialized training for the men who are to enter upon the work of designing, building, or operating aircraft, was not so obvious a dozen years ago, when the airplane was hardly considered even as a toy, when the airplane industry was practically non-existent, and when the Army and Navy air services together possessed scarcely a score of machines of all classes. The late President Richard C. MacLaurin of the Massachusetts Institute of Technology, with great far-sightedness and faith established in 1913 a full-time aeronautical course which has trained many of the leaders in American aeronautics.

Hunsaker

The first instructor in the course, and the man who shaped its form during its first years was Lieut. Jerome C. Hunsaker, now Commander Hunsaker and attached to the American Embassy in London. It was while Lieutenant Hunsaker was in charge that the Army air service adopted the policy of sending a small number of officers, carefully selected for their technical qualifications, to the Institute for advanced studies in airplane design and kindred subjects. That policy still continues, M.I.T. being the only institution so used. Twenty-one Army officers have taken the graduate course in aeronautical engineering in peace-time, as well as 75 men who passed through the intensive courses in aeronautical engineering (the only ones of their kind in the United States) organized in the spring of 1918 at the request of the War and Navy departments. Since those intensive courses were started, with the exception of a brief period immediately following the armistice, the aeronautical work has been under the direction of Professor Edward P. Warner, himself a holder of the Institute's degree in aeronautical engineering. Aeronautical instruction has, however, long since ceased to be a one-man affair. The staff has grown in proportion to demands, and now includes, in addition to Professor Warner, Professor Charles P. Burgess, airship design expert to the Bureau of Aeronautics, who has been dividing his time between the Navy and the Institute in recent years and taking charge of the work on the design of lighter-than-air craft and Professor William G. Brown, who gives courses on aeronautical laboratory and free-flight test methods, aircraft instruments, and aircraft armament, an instructor who assists in the guidance of the students' work in the drafting-room, and five research associates who operate the wind tunnels.

Believing in the impossibility of divorcing research from instruction, the governing authorities at M.I.T. have sought always to provide laboratory equipment of the most up-to-date sort, to give the students practise in using that equipment both under direct supervision and in carrying out tests undertaken on their own initiative and planned by themselves, and also to do real research work in aerodynamics and routine testing of models for the Army, for firms in the industry, and for private parties. A wind tunnel of some sort has been available for such work almost continuously since 1911, when a group of students in mechanical engineering started aeronautical research work under his direction. In 1914, Commander Hunsaker built, after a British pattern, a four-foot tunnel with a maximum wind speed of forty miles an hour. That was used for hundreds of tests during the next six years, finally being replaced in 1920 by a tunnel of the same diameter but of quite different design, the work of Professor Warner and William H. Miller, then an instructor in aeronautical engineering. The new four-foot tunnel of much higher efficiency than the old, has raised the speed to 60 mi./hr., and has proven so successful that when, in 1922, funds for completing a tunnel 7½ ft. in diameter became available the general design was kept very much the same, although the use of a 100 hp. motor makes it possible to reach a speed of 90 mi./hr. This wind tunnel is the greatest in diameter that is operated directly by any educational institution in the world. It is of course equipped with the ordinary complement of balances, and also with a propeller dynamometer just completed, permitting the measure of all the forces and moments acting on a model and also of the thrust and torque of model propellers of any diameter up to three feet and turning at any speed up to 5000 r.p.m.

The M.I.T. aeronautical staff and the graduating class. The staff are, reading from left to right; Markham, Brown, Nichols, LePage, Warner, Burgess, Eade and Ober (behind Brown's right shoulder)

The graduates of the aeronautical course at M.I.T., together with men who attended the Institute as undergraduates before the specialized course was fully under way, have taken an important place in government service and in the industry. Every officer who has ever been chief engineer at McCook Field, four in all, has held the Institute's degree in aeronautical engineering, McCook Field department heads almost too numerous to mention have had either the full graduate course or the intensive one given in 1918, and all of the chief engineers at the Naval Aircraft Factory have been Institute graduates, although their attendance in Cambridge antedated the foundation of the aeronautical course. An M.I.T. graduate is in charge of the wind tunnels at McCook Field, and two graduates of the aeronautical course successively directed the aerodynamic and free-flight work at Langley Field for the first four years after the National Advisory Committee for Aeronautics started its laboratory there. To take only a few examples from the industry, Donald W. Douglas and Thomas H. Huff of the companies which bear their respective names and V. E. Clark of the Consolidated Aircraft Corporation, as well as engineering employes of the Curtiss, Wright, Boeing, Douglas and Upson companies, among others studied aeronautical engineering at the Massachusetts Institute of Technology. Graduates are employed in civilian capacity by the Army, the Navy, the Air Mail, and the National Advisory Committee, and more go out into the industry each year. The number of men taking the full aeronautical course at M.I.T. ranges from 15 to 20 each year, including from six to ten civilians, from two to eight naval officers sent each year to M.I.T. under substantially the same conditions that have long attended the coming of the representatives of the Army Air Service, and approximately the same number from the Army. The students in the course in naval construction, too, naval officers detailed for the purpose, have been giving more and more time to aeronautics in recent years and now take the regular graduate work in airplane design, making a total of from 25 to 45 taking that subject.

The work at M.I.T. is primarily for graduate students, and an advanced degree is given, although it is possible for properly qualified undergraduates to take many of the subjects. The demand for men in the aeronautical field is still very light. It is considered best for the present to train a limited number of highly-qualified specialists, preferably men who have already given evidence of their ability before entering the course, rather than to give a scantier survey of the subject to a larger number of men of less mature mind.

The claims of the undergraduate are by no means slighted, however. An elective course in aeronautics, comprising sixty descriptive lectures on design, is offered to seniors and well-qualified juniors, and is taken by from thirty to seventy men each year. A course of lectures on the organization and operation of air transport enterprises has also gained some popularity with seniors specializing in economics or business management. Furthermore, there is at M.I.T. an Air Service unit of the Reserve Officers' Training Corps. Students who can pass the regular physical examination for service pilots may enroll in this unit and receive instruction in rigging, engine operation and maintenance, radio, photography, and the other practical subjects allied to the work of the Air Service, entirely without cost to themselves. The practical instruction is offered during the school year and in the course of a summer camp held at some Army flying field, and the student has the opportunity of going to Brooks Field after graduation and taking the regular course to qualify as a pilot. There is opportunity also to learn to fly in the Navy if that is preferred, as the Naval Reserve air station at Squantum, only ten miles from Cambridge, offers a flying course open to M.I.T. men attaining the exacted physical standards.

The work in aeronautical engineering at the Institute has expanded steadily. No year has passed without the addition of at least one new subject of study to the list of electives, and the latest catalogue of work to be offered next year lists subjects bearing directly on aeronautics and intended primarily for aeronautical students under more than twenty distinct headings. It is the evident intent of President Stratton and his associates in framing the institution's policy that the school which was first in the field with an aeronautical course shall maintain its well earned laurels.

Gordon Bennett Results

The following are the official results of the First International Balloon Race for the Second Gordon Bennett trophy.

No.	*Balloon*	*Country*	*Pilot*	*Aide*	*Kms.*	*Miles*
1	Prince Leopold	Belgium	A. Veenstra	P. Quersin	1345	835.7
2	Belgica	Belgium	E. Demuyter	L. Cockelberg	681½	423.4
3	Ciampino, V	Italy	Com. di Storm. Valle	Com. di Squ. Paonessa	598	371.6
4	Aerostiere III	Italy	Capt. Giovanni Grassi	Tan. Franc. Tarantola	537½	333.9
5	Picardie	France	M. Bienaime	Ravaine	472½	293.6
6	Ville de Bruxelles	Belgium	Capt. M. Labrousse	Com. M. Dewandre	472	293.3
7	Helvetia	Switzerland	Dr. O. Bachman	E. Traxler	470	292.0
8	Banshee III	Great Britain	Lt. Col. J. D. Dunville	Squad-Lead. F. W. Baldwin	465	288.9
9	Miramar	Great Britain	Capt. C. W. Spencer	C. W. Berry	463	287.7
10	Ciampino III	Italy	Com. di Squ. Ilari	Ten di Squ. Precerutti	430½	267.5
11	S14	United States	Lt. W. J. Flood	Lt. Haynie McCormick	228½	142.0
12	Fernandez Duro	Spain	Joachim La Llave	Jose Ansaldo	213	132.3
13	Maroc	France	G. Blanchet	de Montjon	205	127.4
14	Elsie	Great Britain	Capt. J. F. Johnson	Com. F.L.M. Boothby	197½	122.7
15	Capt. Penaranda	Spain	Ed. Sussana	Andre Riveras	143½	89.2

DISQUALIFICATIONS

Goodyear III	United States	W. L. VanOrman	C. K.Wollam	Landed at Sea
Esperio	Spain	Leon de La Rocha	Fontan Lobez Jesus	Landed at Sea
Grande Charles	France	Lt R. Latu	Lt. Francin	

The photo at the left shows a Boeing plane (Wright Whirlwind 200 hp. engine) of the Peruvian Navy. The one at the right shows the Peruvian Naval Training Station at Ancon, the Petty Officer's Barracks, Office Building, Officer's Club, Student's Club and the Commander's Quarters can be seen

AIRPORTS AND AIRWAYS

Cleveland, Ohio

By Cy Caldwell

Glenn L. Martin, governor of the N.A.A. for Ohio and president of Cleveland Chapter, has been appointed chairman of the Organizing Committee to help the city celebrate the opening of its new Municipal Airport on July 1. As Mr. Martin's experience with humanity has led him inevitably to the conclusion that the great need of man is food—and possibly drink—the Cleveland Chapter N.A.A. is giving a grand aviation dinner in Cleveland Public Auditorium one of the largest halls in the world. Over 3,000 people will be served, from Henry and Edsel Ford who will be present down through a crowd of citizens, and on down still further to reporters, who horn in to everything.

The asparagus alone served at this dinner, if laid end to end would stretch from Cleveland to Chicago; and the combined sound of soup inhalation, if collected in a radio transmitter would reach the Eskimo in Greenland and the savage lying at his ease in the Solomon Islands. However, a large orchestra has been hired to drown out this number and the Committee is attacking the problem of how to render innocuous the aroma of moth balls clinging to dinner suits. Spraying all guests with acetate dope is suggested as an easy solution.

The Army and Navy, Air Mail, and many civilian organizations including the Stout Company of Detroit and the Glenn L. Martin Company will send planes to the new airport to stage a demonstration beginning at 10:30 a. m. July 1, when the first mail plane lands, and lasting until night when the night mail from Chicago arrives and departs for New York.

Art Smith, veteran mail pilot, the first man to do sky writing, and who won international fame by looping at night at the San Francisco World's Fair, will stage a series of thrilling night flying stunts, including looping at low altitudes while he sets off fireworks attached to the plane.

Bill Stout will present his famous act, the Evolution of a Tin Can, otherwise, the Stout All Metal. Bill's glories have been overshadowed by the name of Ford, whose Chief Engineer, Mr. Mayo, will fly over in the plane. I mention Bill Stout here so that the world won't forget that Bill, and not Henry, built that plane. If Bill doesn't get a press agent he'll reach the condition of that chap whom Shakespeare mentions:—"Alas, poor Yorick !"

It is expected that a crowd of over 200,000 people will be present on the field to welcome the ships of the Air Mail as they land at their new home. Their three fine new hangars are ready, and the field is graded and rolled, and the night lighting is installed and operating.

Local orators are practising their speeches beginning, "On this most auspicious occasion—blah—blah." However, the field is large, and if you get away over in the western corner, you won't hear anything.

The Sanborn Aviation Co., P. H. Sanborn, manager is operating a flying field fronting on Euclid Ave., just west of Willoughby, Ohio, and some eight miles east of Cleveland City limits. For information of pilots: Euclid Avenue is part of the main route between Cleveland and Buffalo and runs just south of the Nickel Plate and Lake Shore tracks, two miles from Lake Erie. Field lies between railroad and road, is only partially cleared, but has two fairly smooth runways that make an $\times$ on the field.

Sanborn has erected a three-ship hangar, a large lunch room, rest-rooms, a filling station for cars and another for planes. A space, 1500 by 200 ft. is provided for parking cars and the large crowd of Modocks who invariably infest a flying field. (A Modock is a bozo who loves to watch flying, but never buys himself a ride.) Cars and Modocks are kept within their alloted space by a cyclone wire fence which separates this public space from the flying field. The Sanborn Company has one Hispano Standard in operation and will have other ships soon. Frank Williams is chief pilot for the company.

E. F. Beckley has erected a DH6 with OX5 engine which D. L. Noyes is operating and is teaching Beckley to fly at Sanborn Field. They have secured an advertising contract with a real estate firm and are embarked on uncharted seas of commercial aviation whose storm tossed expanse is so frequently dotted with wrecked survivors clinging to rafts.

Airplane Float of the San Joaquin Valley Aeronautical Association at the Fresno Fete

Swedish Airways

Commercial flying has apparently taken hold in Sweden according to L. A. France, office of the Commercial Attache, Stockholm. The Swedish companies are active in promoting the development of air routes, and considerable public interest is focused on this means of travel. A large company is reported to have been formed recently with German and Swiss capital for the purpose of amalgamating all the air transport lines into one network managed and operated under one efficient organization. Details are not yet available.

The following air routes have been successfully operated since May 15, 1925: Malmo-Paris (via Copenhagen, Hamburg, Amsterdam, and Brussels); Malmo-Berlin (via Copenhagen); Malmo-London (via Copenhagen, Hamburg and Amsterdam); Stockholm-Helsingfors (connecting with the Helsingfors-Riga-Reval line). Daily service (except Sunday) is maintained on these routes, which are operated by the Swedish company Aktb. Aerotransport in conjunction with various foreign companies. This company has now received government support in the shape of a subsidy of 500,000 Swedish crowns ($132,611) and, in this respect, is on the same basis as its foreign allies, all of whom receive substantial assistance from their respective governemnts.

The Stockholm-Danzig-Berlin route, connecting with Danzig-Koenigsberg, was opened June 5. The Swedish company Nordiska Flygrederiet cooperates with the German Aero Lloyd in maintaining a schedule of three trips a week. Passage requires about 9 hr.—four to Danzig and five from there to Berlin. Until the newly organized Swedish company receives Government assistance, the subsidized German company will operate over the route.

A Polish company has recently received permission from the Swedish Government to operate an air transport line between Warsaw and Copenhagen, via Malmo. A ten year

concession has been granted, but the paying possibilities of this route at the present time are questioned in some quarters.

The German Junkers company has also received permission from the Swedish Government to operate a strictly commercial line between Berlin and Stockholm. No passengers can be carried, and the concession is granted for only five months dating from the time the company commences operations.

Eagle Airport

This airport which is owned and operated by Dr. H. J. Neubauer, is located at Hinkley, Ill., approximately 40 mi. south west of Chicago, and 12 mi. south east of De Kalb, Ill.

The field is about twenty-five acres, and level as a board, with excellent approaches from the north, east and south, the approach from the west is slightly obstructed by a farm surrounded by tall timber.

The field is plainly visible at 3,500 ft., as the hangar and all objects around it are painted white, the name (Eagle Airport) is painted in white letters 3 ft. high on the roof of the hangar.

Everything about the field is arranged very attractively, both for the comfort of the crew and the public. A refreshment stand is maintained where one can obtain lunches, drinks, etc., large benches with umbrellas to protect spectators from the sun. North of the hangar is a large modern tennis court, and swings for the amusement of the young as well as the old. At the south end of the field is a trap house and equipment for shooting.

The past four months a large amount of passenger work, exhibition and student work, with around 1,500 mi. of cross country flights, and night flying, have kept the airport very busy. At the present time it is being equipped to open a modern flying school, where one can obtain a course in flying at very reasonable rates. The present equipment consists of one XX Standard and one JND4 with a tentative order for additional equipment.

Any airmen are welcome to the airport. Practically every thing in the way of repairing can be handled and a large stock of oil and gas is maintained for their convenience. The staff consists of H. J. Neubauer, M. D., A. J. Lacey, pilot, W. E. Thatcher, pilot, Raymond Hobbs, mechanic.

Milwaukee, Wis.

By Dan Kiser

After reading some of our Milwaukee newspapers for the past month, one would get the impression that the most important thing in life, with the possible exception of finding a cool spot in which to live, would be to establish an airport here, located somewhere in the vicinity of some of our tallest buildings, where the tired business man might get a little relaxation by looking out his office window and watching the air traffic go by. The general agitation is for a lake front airport for combined land and water craft. Some eager gentleman, who probably believed in a fairy tale, recently told in the Airports Section of AVIATION about a young man who purchased a Jenny and made his fortune carrying passengers, suggested that everybody using airplanes in Wisconsin purchase amphibians, thereby solving the landing field problem, as Wisconsin has lots of water, reputation of Milwaukee to the contrary notwithstanding. Said gentleman forgot to tell the boys what to use for money, and we are sure that even the manufacturers of amphibians like to order a meal occasionally without too much attention to the right hand side of the menu. However, the airport question is still on the fire before this and that Committee.

Meantime, business is picking up at the airport, and visitors for the past two weeks included Lieutenant Howard from Chanute, broadcasting by remote central from WLS, Chicago; Mr. Boettcher, from Chicago with a passenger in a Lincoln Standard 5 place ship; and the usual gypsy fliers from different parts of the state. Three planes piloted by Holoubek, Wiens and Kiser, flew a formation to Westfield and dropped flowers over the grave of the late Ralph Conant of Westfield, who was killed recently in an accident while instructing a student in a J1 Standard with OX5 engine.

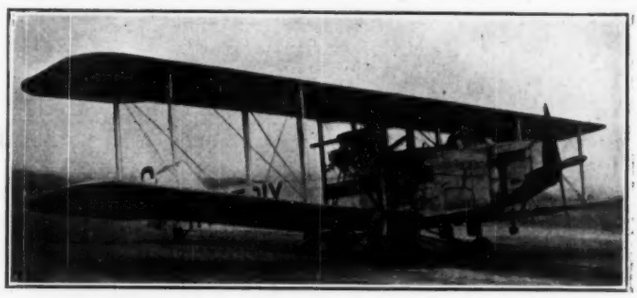
A new plane recently tested at the airport developed very good flying qualities, considering its original design was the well-known and justly celebrated Canuck. It has short Canuck panels all-around, a streamlined nose, with radiator below the fuselage. The speed, as near as tests to date have developed, shows about 85 mi./hr., with the same carrying capacity and general performance as the Canuck. It is owned by C. H. MacMillan of Fond du Lac, Wis.

Mr. Meisenheimer has his old EI Standard Scout again, after having it renovated in the shops at New Butler, and now sports the two fastest ships in the state. The *Wisconsin News* is organizing an air race for Wisconsin planes; the date and conditions of the race are to be announced shortly. Since Wisconsin planes include an overwhelming percentage of Canucks, Jennies and J1 Standards, we have visions of the startling speed of 70 mi./hr. being reached.

Aerial Paymaster

Employees of the Spalding Construction Co., which has just completed work on the new postal air fields at New Brunswick, N. J.; Bellefonte, Pa., and Cleveland, Ohio, are receiving their pay by airplane. William B. Arthur, general superintendent of the company, left Curtiss Field July 1 in an airplane piloted by "Casey" Jones with payrolls for all employees at the three fields.

A stop was made at Hadley Field near New Brunswick, where, after paying off his men, Mr. Arthur remained for the ceremonies which marked the inauguration of the New York-Chicago night Air Mail. Later he continued the journey to the other fields.



P. & A. Photo

The three-engined Handley—Page used by Imperial Airways. There is a Rolls-Royce in the nose and two Siddeley-Pumas in the wings

Wichita, Kans.

From all indications Wichita will be one of the leading aviation centers of the country. With the success of last year's air races still in the minds of all those who were in attendance, and the constant sight of aircraft over the city, the visitor can understand what he can expect at his own home town in the very near future.

Wichita's airplane factories, the Swallow Air Plane Mfg. Co. and the Travel Air Inc., are both working full capacity. The Swallow company is now working a night force endeavoring to fill the orders they now have on file.

J. M. Mollendick, president of the Swallow company, has just returned from an eastern trip including stops at Des Moines, Davenport, Moline, Chicago, Milwaukee, Detroit, Cleveland, Cincinnati and St. Louis. He traveled in one of his planes, piloted by Perry Hutton. Mr. Mollendick reports business far better than he ever expected.

Garver Flying Circus, the oldest and largest in the country, now has its headquarters in Wichita. Paul Duncan is still with the show as parachute jumper and wing walker.

Carter Harrison has just purchased two Swallows, a four place and a three place job. He will locate on the municipal field at Arkansas City, Kan., as the town is the center of the midcontinent oil production. The oil men of this section are all aviation boosters for they realize the importance of the airplane as a means to transportation.

C. Pat Murphy, formerly of Oklahoma City, is now in Wichita to establish an air line between this city and Galveston, Tex. He intends using Wichita made airplanes.

'Rusty' Campbell has just left for his home at Moline, Ill., with his Travel Air plane which was delivered to him last week.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Army Air Orders

Maj. Hubert R. Harmon, A.S., McCook Field, to Washington.

Following officers, A. S. Off. Res. Corps, relieved from duty Langley Field, and ordered to stations indicated, reverting to inactive status June 30: First Lieuts. William Terrell Atkinson, Kansas City, Lewis Love Bowen, Omaha, William Sidney Wilson, jr., Gainesville, Harry Joseph Brady, New York City, Sec. Lt. James Joseph Welker, Glen Head, L. I.

Sec. Lt. Edward H. White, A.S., Kelly Field, to Scott Field.

Ord. 132 relieving First Lt. Ernest E. Harmon, A.S., Bolling Field, and directing him to proceed to McCook Field, revoked, Lieutenant Harmon to report to Chief of A. S.

Transfer of Sec. Lt. Frank Riley Loyd, A.S., to Inf. announced. Lieutenant Loyd relieved from duty Kelly Field and ordered to proceed to Fort Sam Houston.

Following officers A. S. Res. ordered to active duty Langley Field, from places indicated, reverting to inactive status Dec. 31: First Lts. Thomas Darl Behne, Washington, Wayne Sanger Green, Brooklyn, Abbott Claxton Martin, Boston, Sec. Lts. Darr Hayes Alkire, Salt Lake City, Elmer Joseph Rogers, jr., Quincy, Leslie Ralph Tower, Seattle, George Albert Weiss, jr., New York City.

Sec. Lts. James Henry Collins, A.S., Akron, and Wayne Clarke Williams, Houston.

Order 72, relieving Sec. Lt. Leonard S. Flo, A. S. Res., from duty Selfridge Field, amended to relieve Lieutenant Flo from duty that station, at such time as will enable him to arrive in Omaha Dec. 31.

Capt. Vincent B. Dixon, A.S., A. S. Eng. Sch., to Com. Off., McCook Field.

First Lt. Leigh Wade, A.S., Bolling Field, to Harvard Grad. Sch., Bus. Admin., Cambridge, for instruction.

THE TRAINING CAMPS

Wilbur Wright Field

From June 14 to 28, 1925, a Training Camp for Air Service Reserve Officers was held at Wilbur Wright Field. The following were in attendance: Maj. William A. Bevan, Maj. Leon B. Lent, Capt. Roy E. Ludick, Capt. Alfred E. Bennett, 1st Lieut. Robert R. Fetterhoff, 1st Lieut. Homer V. Farris, 1st Lieut. Herman C. Brigham, 1st Lieut. Ledereich S. Vance, 1st Lieut. Richard M. Harnett, 1st Lieut. Walter R. Avery, 1st Lieut. Edwin H. Bassett, 2nd Lieut. Max W. Henney, 2nd Lieut. Charles E. Hastings, 2nd Lieut. Albert C. Komdat, 2nd Lieut. James Z. Moore, 2nd Lieut. Jseph C. Clarke, 2nd Lieut. William E. Bohlender, 2nd Lieut. Leland S. McGinn, 2nd Lieut. William K. Ebel, 2nd Lieut. Roy L. Pixler, 2nd Lieut. Thomas B. Akin, 2nd Lieut. Lawrence J. Eyler, 2nd Lieut. Waldo H. Rose, 2nd Lieut. John R. Means, 2nd Lieut. Edwin H. Eglekraut, 2nd Lieut. James H. Collins, 2nd Lieut. George M. McCable, 2nd Lieut. Sidney A. Stout, Sgt. 1st Class Howard H. Maxwell.

This camp is altogether different from any camp previously held at Wilbur Wright Field, for the reason that those who attended were directly assigned to a tactical organization, instead of being organized as a separate camp.

All of these Reserve Officers were assigned to the 88th Observation Squadron, which is permanently located at this Field. They were given assignment as assistants to the officers in charge of the various squadron activities, with the idea of giving them the same training that is given to the regular personnel. Lectures and practical demonstrations in all phases of the work of an observation squadron were given. For example, instruction was given in the communications work of an observation squadron; in photography (including the work of a photo laboratory); in airplane rigging; in engine overhaul; in the installation, operation and maintenance of special equipment, and in the method of handling operations within the squadron.

The writing of Air Service operation orders and preparation and routing of correspondence and reports were given special attention. The system of supply and of cost keeping was explained in detail.

Special emphasis was placed on recent development of aircraft armament. The operation and maintenance of machine guns was explained, both the Lewis and Browning guns being used. Lessons in practical bombing were given, each officer being offered the chance to act as pilot and as observer; the 50 lb. demolition bomb was used with a 2 lb. black powder charge. Artillery shoots were simulated with the use of puff targets. The Reserve officers on these missions served alternately as pilots and observers. A feature of the training was the use of radio communication wherever possible. For example, the accuracy of battery fire was reported by radio from the DeHaviland plane in the air to the radio truck on the ground.

One day was spent at McCook Field, where the Reserve officers were shown the latest achievements of the Engineering Division.

A considerable amount of refresher work in flying was given. The total amount of flying time was 262 hr. 20 min.

On Sunday, June 21, a series of extensive cross-country flights were undertaken, the pilots going to Cleveland, Akron, Indianapolis, South Bend, and elsewhere. There was only one forced landing, and no injuries of any kind occurred.

Following is a list of the regular officers of the 88th Squadron, with their assignments at this camp:

Maj. H. J. Knerr, camp commander; Capt. J. A. Colgan, camp adjutant and operations officer; Capt. G. F. Christine, camp supply, recreation officer, recruiting officer and publicity officer; Lt. M. N. Stewart, communications officer; Lt. H. A. Sutton, officer in charge of armament; Lt. C. W. Pyle, engineer officer and transportation officer; Lt. E. P. Gaines, photographic officer; Capt. A. W. Stevens, photographic officer.

On Thursday evening, June 25, a dance was given to the officers of Wilbur Wright Field by the Reserve officers. The dance was held at the Officers' Club.

Langley Field

Many months ago the schedule of Summer Camps for Langley Field was received and the detailed program laid out. Camp sites were selected and surveyed. Aeronautical equipment was requisitioned and on hand ready for use. Messes had been provided and the entire personnel of the largest flying field in the East awaited the dawn of June 14 which would mark the opening of the summer training season for the personnel of three components of the Army of the United States. The officers responsible for the organization and operation of the several camps were drawn from the graduates of the Air Service Tactical School, whose course had just been completed, as well as from the especially qualified officers on duty at Langley Field.

Prior to their departure from their homes, the Reserve Officers ordered to active duty for the training period had been furnished with a little brochure and transportation guide in order that they might be more familiar with the historical interest and recreational facilities afforded them in this oldest settled part of Virginia, so close to the settlement at Jamestown and only a two minutes air hop from the spot where the Monitor and Merrimac fought their famous duel

during the Civil War, upon which our modern naval development is based.

During the day in question, some thirty-five Reserve Officers, in rank from field grade to second lieutenant, reported to the Headquarters tent where they were assigned to quarters and drew the needed equipment as well as completing arrangements for their special physical examination to determine their fitness for flying duty. At the same time they were welcomed to Camp by the Post Commander and made to feel their responsibility and individual share in the broader scheme of National Defense.

By Tuesday morning everyone had settled down to the serious work of the camp, which included flying for those qualified as flying officers, while those individuals who were specialists in the technical and administrative matter were assigned to the Supply, Maintenance and Engineering Sections to pursue the prescribed course of instruction.

During the afternoons these officers were given lectures on various aviation subjects. These lectures lasted somewhat over an hour and are given by Regular Officers who have spent months in their preparation for this work. The basis of all lectures are found in the doctrines enunciated by the Air Service Tactical School.

Mess facilities are always of prime interest. A non-commissioned officer from the Quartermaster Corps who was unusually well qualified to operate a mess, was detailed to handle the work. A menu of high quality, and more than enough quantity, was consistently maintained at a nominal cost. Judging by the number of "seconds" that were called for, success was obtained in the matter so strongly pointed out by the great Napoleon.

The following constitute the Personnel of the Camp Staff and instructors: Maj. Jacob E. Fickel, A.S.; Maj. Clarence L. Tinker, A.S.; Capt. Shores E. Clinard, M.C., Capt. Clarence F. Hofstetter, O.D., Capt. Edward C. Black, A.S., 1st Lt. William A. Hayward, A.S., 1st Lt. George C. McDonald, A.S., 1st Lt. John A. Kase, A.S., 1st Lt. Wililam J. McKiernan, A.S., 1st Lt. Elden Q. Faust, Q.M.C.

The officers who reported for duty were as follows: Maj. James B. McCalley, Pittsburgh, Pa.; Capt. John M. Barrett, Baltimore, Md.; Capt. Henry K. Gibson, Cherrydale, Va.; Capt. Edgar Graham, Washington, D.C.; Capt. Carl C. Loth, Waynesboro, Va.; Capt. Loren E. Roherer, Pittsburgh, Pa.; Capt. Oscar A. Reed, Washington, D. C.; 1st Lt. Hyman I. Robinson, Baltimore, Md.; 1st Lt. Paul A. Sandberg, Pittsburgh, Pa.; 1st Lt. Theodore Taney, Pittsburgh, Pa.; 1st Lt. Norman B. Ames, Washington, D. C.; 1st Lt. Edward Brown, Wilkesbarre, Pa.; 1st Lt. Robert A. Culbertson, Erie, Pa.; 1st Lt. John C. Mansfield, Sewickley, Pa.; 1st Lt. James M. Moore, Pittsburgh, Pa.; 1st Lt. Ellis S. Middleton, Washington, D. C.; 1st Lt. Charles D. Martin, Washington, D. C.; 1st Lt. Harry F. McCaffrey, Pittsburgh, Pa,; 1st Lt. Philip J. Newland, Riverdale, Md.; 1st Lt. Charles C. Wood, Waynesburg, Pa.; 1st Lt. Donald O. Woolf, Washington, D. C.; 2nd Lt. Carl D. Bailey, Carmichads, Pa.; 2nd Lt. Joseph L. Cain, Washington, D. C.; 2nd Lt. John A. Irwin, Bellevue, Pa.; 2nd Lt. Kenneth F. Lovejoy, Pittsburgh, Pa.; 2nd Lt. Roger S. Powell, Harrisburg, Pa.; 2nd Lt. Robert J. Wilde, White Marsh, Md.; 2nd Lt. Martin B. Dale, Washington, D. C.; 2nd Lt. Donald L. Fleming, Glenshaw, Pa.; 2nd Lt. Robert H. Guyton, Pittsburgh, Pa.; 2nd Lt. Otto E. Kirchner, Hampton, Va.; 2nd Lt. Walter E. Lick, North East, Pa.; 2nd Lt. Kenneth C. Wood, Richmond, Va.; 2nd Lt. James S. Brown, Uniontown, Pa.

U. S. NAVAL AVIATION

Navy to Map Alaska

For several months the Secretary of the Interior, through his associates has been in negotiation with other departments of the Government that operate airplanes, to have portions of southeastern Alaska photographed from the air. The reasons for these negotiations are set forth in a letter from Secretary Work to the Secretary of the Navy in which he says:

This department, in connection with its investigations of the mineral resources of Alaska by the Geological Survey, finds that the lack of adequate maps of much of the region back from the coast in southeastern Alaska is a severe handicap. I believe that the investigation of the mineral resources of this area would be much facilitated and a considerable saving to the Government could be effected if this region were photographed from the air, so that knowledge of its general features could be made available to the geologists of the Geological Survey.

Secretary Work has just received reply to this letter from Secretary Wilbur who assures him of the willingness of the Navy to undertake the survey as soon as possible and to furnish the airplanes, personnel, and other necessary facilities, with the understanding that the Geological Survey will pay a portion of the expense.

The area to be covered by airplane photographs is approximately 18,000 sq. mi. The project presents many technical difficulties, as storms and low-lying clouds are frequent in southeastern Alaska, and the relief of many of the islands along the coast is strong, some of them rising abruptly to heights of more than 4,000 ft. Furthermore, there is in this part of Alaska so little flat land that has been cleared and is suitable for landing fields that probably seaplanes will be used exclusively. Consequently, considerable special equipment and personnel will have to be assembled and a good deal of careful planning must be done to insure the economic conduct and successful completion of the work.

Although the work is to be done at the specific request of the Interior Department, it is believed that the results will be of material service to many of the other Government departments and bureaus, both in the civil development and in the military defense of the country. Members of several other bureaus, especially the Coast and Geodetic Survey, the Forest Service, the General Land Office, and the Federal Power Commission, have expressed keen interest in the project and have informally offered such assistance as their regular duties permit. Indeed, the entire undertaking appears to be one of close cooperation by which duplication of effort is avoided, economy is practiced, and the results are utilized by many. It is expected that the experience in aerial surveys derived from the mapping of this tract may furnish valuable information that will be of service in solving some of the difficulties that prevent the examination of certain coastal tracts in other parts of Alaska. Many of these coastal tracts are traversable on foot only with great difficulty and at so high a cost that their survey is not warranted under present conditions.

Navy Air Orders

Lt. (jg) Dolph C. Allen det. Nav. A. St., Anacostia, to Navy Yard, Philadelphia.

Ens. Alvin D. Chandler det. U.S.S. Williamson to temp. duty Nav. Air Sta., Pensacola.

Ens. William H. Hamilton det. U.S.S. Hopkins to temp. duty Nav. Air Sta., Pensacola.

Ens. John W. King det. U.S.S. Milwaukee, to temp. duty Nav. Air Sta., Pensacola.

Ens. Richard M. Scruggs det. U.S.S. Arizona to temp. duty Nav. Air Sta., Pensacola.

Lt. Comdr. Frank C. McCord det. Off. Nav. Op. Navy Dept., temp. duty Nav. A. Sta., Lakehurst.

Lt. Samuel P. Ginder det. U.S.S. Wright, to duty Staff. Comdr., Aircraft Sqdns., Setg. Flt.

Lt. (jg) Linfield L. Hunt det. U.S.S. Farragut to temp. duty Nav. Air Sta., Pensacola.

Lt. (jg) Dewey G. Porter det. U.S.S. Cleveland to temp. duty, Nav. Air Sta., Pensacola.

Ens. George A. Dussault det. U.S.S. Cleveland to temp. duty Nav. Air Sta., Pensacola.

Ens. George F. Howland det. U.S.S. Barry, to temp. duty U.S.S. John D. Edwards.

Lt. (jg) Robert W. Bockius det. U.S.S. Tracy to temp. duty Nav. Air Sta., Pensacola.

Lt. Comdr. Paul M. Bates to continue duty Gen. Inspr. Nav. Aircraft; ords. June 9 revoked.

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PUBLISHER'S NEWS LETTER

Now that the National Air Transport has ordered ten Carrier Pigeons to start its New York-Chicago service, there will be some figuring done as to just how much flying these planes could do. As the N.A.T. does not plan to fly Saturdays or Sundays, the number of round trips per year may average about 250, making allowance for holidays and trips cancelled on account of bad weather. The round trip is about 1500 mi. to which should be added ten per cent for ferrying and testing. This would give a total flying mileage for one year of 412,500 mi. Taking this route mileage and using 100 mi./hr. as an average speed we find that the ten planes will be required to fly 4000 hr. per year or 400 per machine which means a total average use of a machine of 1.6 hr. per flying day or a little over one hour a day for the calendar year. As the life of a modern airplane can be considered to be 200,000 mi., the above estimating would indicate that ten Carrier Pigeons would last five years—eliminating crashes.

It will be recalled that Colonel Searles of the Daimler Hire and later of the Imperial Airways claimed that no airplane could make money unless it flew eight or more hours a day. Furthermore, he actually proved that airplanes can do that much flying every day.

* * * *

When all the enthusiasm over air transport has calmed down and costs and profits are the main objectives, then just two questions will be uppermost in the minds of the directors of the N.A.T. How much traffic was there? What mileage did we get from our equipment? After all is said about the enterprising vision of pioneers in air transport, the net result will probably center around these two factors. We have seen estimates that called for a complete rebuilding of a Service plane after every 500 flying hours, and after every 100 hr. for engines. These estimates also did not include the crashes. On this basis each of the ten Carrier Pigeons would have to be rebuilt once every year. It will be one of the most interesting phases of the development to observe the departures from Air Mail practice of a company headed by men with aircraft experience. Nearly every one has heard the statement made that if the Air Mail is inefficient it is because it is limited by governmental restrictions, civil service and to a minor degree, political considerations. Every one will watch the planes of the N.A.T. with this in mind.

* * * *

As the most important fact that remains to be proved about aircraft is their possibilities as profitable means of transportation, it will become increasingly important to have some method of figuring costs. Until recently these have been made public only by the Air Mail and even these have not included some of the most essential factors that should be known about the operation of commercial air lines. With this defect in mind AVIATION has asked several engineers who have made an extensive study of air transport costs to give their views as to what constitutes the various items that go into the capital and operating cost sheet of an air line. In the next few months several such studies will appear and it is hoped that they may be useful in giving some standard by which the success of this new form of transportation may be judged.

* * * *

Ever since the advent of the amphibians we have had reservations regarding their utility for commercial purposes. An experience with the Curtiss Sea Gull amphibian that was begotten by the flying designer of Curtiss aircraft, the recticent "Bill" Gillmore, has converted us. We use the word reticent because Gillmore will not even tell when or where he was born for "Who's Who in American Aeronautics." Modesty of this character could reach no greater depths or heights, whichever way you are looking. After a long two hour subway-ferry-train ride to the Aviation Meet of the Twenty-Seventh Division Air Service at Miller Field, Staten Island, the above mentioned designer was found casting admiring glances at what could be fairly called the seaplane with the funny "goofus" land gear. Nothing in the air or on the sea is like it. The "Village Blacksmith" never did a neater job. But when it comes to use, there is no aircraft in the metropolitan area that is in more demand and brings greater financial returns.

* * * *

The weariness that comes from tramping for several hours over a flying field was not only becoming increasingly apparent but the distaff section of the party was also wanting a haven of rest. The prospect of hours of dusty, cindery and tedious voyaging home to Manhattan was not a pleasant prospect. But here is where Gillmore's reticence was at its best. He tucked the tired Mr. and Mrs. Publisher into the old amphibian and after taking off from the flying field, Pilot Caperton folded up the wheels and flew up the Narrows past the skyline of lower New York and deposited his tired cargo on the Hudson River at 86th St. It took just fifteen minutes to do what would have needed two hours by any other form of transportation. After salaaming three times to the old contraption, we made a firm resolve to become a booster for the amphibious type of aircraft. And what was even more significant, the feminine part of the crew was even more enthusiastic. So, once more, here's to the best little money making, pleasure giving aircraft we know.—L.D.G.

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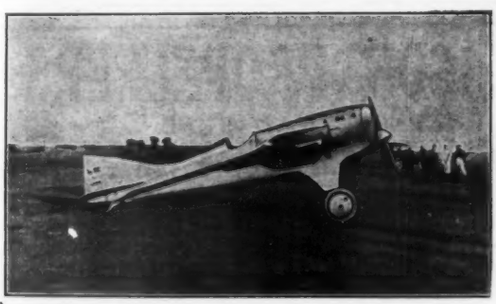

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